# MILITARY REVIEW

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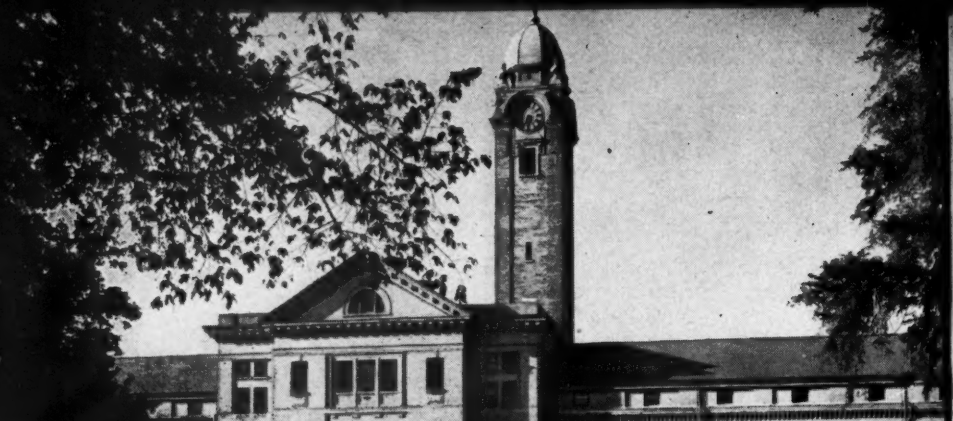

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# The National Guard in the Post-War Military Establishment

Major General Kenneth F. Cramer
Chief, National Guard Bureau, Army Special Staff

TO understand the evolution of the National Guard to its present very vital role in the national defense, one must first understand its origin. There are very few persons today who realize that the regiments of the National Guard have the longest continuous history of any military organizations in the United States.

These regiments were organized from the trainbands and companies voluntarily formed by the early settlers, who were quick to realize the necessity of giving a portion of their personal services to the protection of the life and the property they enjoyed.

The 182d Infantry of Massachusetts, the oldest regiment in the country, was originally organized as the North Regiment in 1636. The 176th Infantry of Virginia was organized as the Charles City-Henrico Counties Regiment of Militia in 1652. The colonists believed it to be their right and their privilege to form these organizations.

When the United States emerged as a nation, that right and privilege was considered so important that it was written into the Constitution.

And when the Bill of Rights was incorporated into the Constitution, the Militia was protected against abolition by the Second Amendment.

Legislation in 1795 and 1798 provided for Federal use of this State militia and these local volunteers. A law in 1808 commenced paying specific amounts annually to the States to support their forces.

Throughout the Nineteenth Century, this aid continued to help the States reimburse the Federal Government for arms and equipment being furnished, for it was always thought that these forces would be employed in the national defense—as they were.

### Reorganization

Elihu Root's general program to reorganize the military establishment after the Spanish American War included the Dick Bill which in 1903 gave the National Guard additional support and required equipment and training standards comparable to those of the Regulars.

The National Defense Act of 1916, as later amended in 1920, provided for local volunteer units, raised and housed by the States, but formally *recognized* and given drill pay by the Federal Government. This formalized, in practice and law in this military field, the typical American amalgamation of local support, Federal aid, and over-all standardization.

Guard regiments inducted into national service had been redistributed in 1917 into the combat divisions of the AEF. In 1920 they were reorganized on a Federal divisional pattern.

So, when World War II struck, they were ready and required only such reorganization as did the Regular Army when "square" divisions were transformed into

"triangular" divisions, and when artillery, cavalry, antiaircraft, quartermaster, engineer and medical regiments were broken down into separate battalions.

Thus, by action of the States themselves from 1865 to 1903, by Federal assistance from 1903 to 1916, by complete reorganizations on combat force patterns in 1920 and strenuous training since, the National Guard has taken its place as a most important factor in our national defense.

### After World War I

After World War I, the National Guard reorganized at the rate of about 40,000 a year for four years, and then the economy era hit. The target strength stated in the Act of 1920 was 435,000. This strength it was never allowed to attain. Guard strength was held down and was stabilized at about 185,000 for a decade and a half. Then under the impulse of Hitler's threat to the peace of the world, the ceiling was raised. New units were created, strengths increased.

By June 1940, the Guard had 240,000. It brought into Federal service between 15 September 1940 and 1942, a total of 300,000 in formed and trained units, comprising eighteen combat divisions and 100,000 in other, separate units. These units trained Selective Service men equal to about half their own number, furnished something like 100,000 officers to the Army of the United States from their own officer corps and enlisted men.

National Guardsmen in World War I had pierced the Hindenburg Line, helped crush the St. Mihiel salient, and smashed to victory through the Meuse-Argonne.

Those of World War II landed under fire on many Pacific Islands, helped reconquer Guam and the Philippines, stormed Omaha Beach in Normandy, pierced the Siegfried Line, and raced into Germany. The casualties of their divisions totaled 175,000. Their colors bear battle honors of most of our fiercest engagements.

In both of these wars, the patriotic, volunteer spirit so typical of our American communities, guided by the Federal Government, spelled much of the final story of victory.

### Post-War Mission

The measure of the National Guard's contribution to final victory is indicated, I believe, by the mission which it has been assigned in the post-war military establishment. This mission was drawn up by a War Department General Staff Committee appointed before hostilities were ended, and it was approved by the Secretary of War on 13 October 1945.

The mission of the National Guard of the United States is:

"To provide a reserve component of the Army of the United States, capable of immediate expansion to war strength, able to furnish units first for service anywhere in the world, trained and equipped:

"(1) To defend critical areas of the United States against land, seaborne or airborne invasion.

"(2) To assist in covering the mobilization and concentration of the remainder of the Reserve forces.

"(3) To participate in all types of operations, including the offensive, either in the United States or overseas."

The local character of the National Guard was reemphasized in the wording of the mission of the National Guard of the *several* States. That mission is:

"To provide sufficient organizations in each state so trained and equipped as to enable them to function efficiently at existing strength in the protection of life and property and the preservation of peace, order and public safety, under competent orders of the State authorities."

To accomplish these missions, the policies approved in 1945 provided:

"The strength of the National Guard will be the maximum which the States can recruit and maintain at a satisfactory standard."

The policies further provided that the initial procurement objective would be not less than 425,000 men.

With this as a guide, the present troop basis was drawn up by the War Department General Staff. It was submitted to the several States for approval, and, finally, just a year and a half ago the organization of this new National Guard was actually begun.

**Strength of 682,000**

According to the present plan there will be more than 682,000 men in this new National Guard when it reaches its full strength, which is more than three times its pre-war size. In contrast to the eighteen Infantry Divisions which served in the last war, there will be twenty-five Infantry Divisions, two Armored Divisions and twenty-one Regimental Combat Teams. The greatly expanded air arm, which consisted of just twenty-nine Observation Squadrons before the war, will be a well-balanced Air Force of twelve Wings and twenty-seven Groups of seventy-two Fighter Squadrons, twelve Light Bombardment Squadrons and the necessary Aircraft Control and Warning Squadrons and other supporting units. The entire country will be protected by a vast network of 789 Antiaircraft Artillery units strategically distributed to give the maximum protection at the points of greatest need.

It is a pleasant duty to report on the progress we have made toward the attainment of our objectives. Since our reorganization began with the Federal recognition of an air unit in St. Louis, Missouri, on 30 June 1946, and with a ground unit in Maryland in August 1946, we have attained a strength of 218,457 men. This is the actual strength reported by The Adjutants General as of 31 January 1948.

**37th Infantry Division, Ohio National Guard, in action on Bougainville.**
**—Army Signal Corps photo.**

The greatest part of this growth came during the recent nationwide recruiting campaign directed by the President of the United States because of the importance of the National Guard to the national defense. A total of 81,648 men were enlisted during the two-month period between 16 September and 16 November 1947, putting us more than two months ahead of our scheduled rate of expansion. We have been able to maintain that margin since then, and anticipate no difficulty in attaining a strength of 271,000 by the end of the present fiscal year and a strength of 340,000 by 30 June 1949.

There is another point that should be made to insure a complete understanding of the National Guard. That is, the division of responsibility between the State and Federal Governments for the support of the National Guard. That division is clearly defined in the Approved Policies of 1945:

"(1) The States will furnish the personnel, adequate armories and storage facilities.

"(2) The Federal Government will supervise the instruction and will furnish the outdoor training facilities, the pay and all uniforms, equipment and ammunition.

"(3) When the requirements for a balanced force in the Army of the United States necessitate the allocation to a State of troops or equipment, the housing or storage of which would impose an inequitable burden upon the State or Territory, such allocation will be made with the understanding that the Federal Government will contribute its equitable share of the expense of constructing and maintaining the required facilities."

### Armory Program

This latter provision—for Federal aid in the construction of Armories—is a departure from the formerly accepted division of responsibility. It is a departure made necessary by the greatly expanded troop basis.

Prior to World War II the Guard organized some 3,400 units with a strength which averaged about 185,000 men. That strength was not based on the capability of the Guard with respect to recruitment, but on a ceiling imposed by legislative appropriations. These Guard units were organized in some 1,829 armories, the majority State-owned and some rented, but in all cases non-Federally owned.

On 15 January 1948 we had 4,005 units housed in the same armories which before the war housed 3,400 units. We had a strength of more than 218,000 men as compared with an average pre-war strength of 185,000 men.

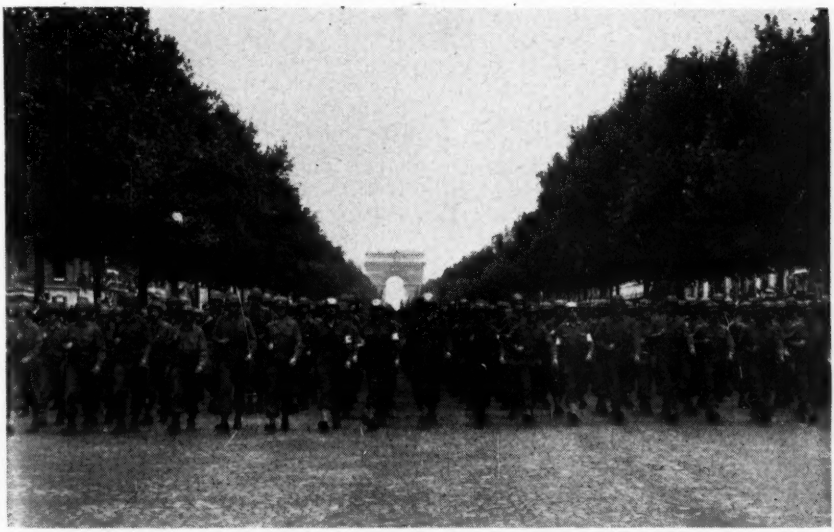
When the Governors of the several States were offered troop allocations of more than three times the pre-war totals, they realized that it would entail an organization substantially greater than any ever before organized, and greater, too, than the defense demands of their respective States. And, so, they generally accepted these increased troop allocations with two conditions. The first condition was the continuation of Selective Service or the enactment of Universal Military Training, which would give the National Guard the necessary manpower to go from 185,000 men to 682,000 men. The other provision was that States would have assistance from the Federal Government with respect to armory construction.

Now we believe that it will require an armory construction program sufficient to give us 1,500 *additional* armories in order to house the 6,365 units planned for the post-war National Guard. We already have arrived at a point where we have some 600 units in excess of our pre-war total and an aggregate strength considerably in excess of the average aggregate strength existing before the war.

### Housing Problem

What then lies immediately ahead of

the Guard? We are convinced now, as a result of our recruiting efforts during recent months, that housing facilities (armories) are probably the most important limiting factor with which we have to contend. If we can raise, as I believe we can, a force somewhat in excess of 300,000 to be housed in existing armories, then it is almost axiomatic that, if armories are provided to the extent of the possibility of the enactment of UMT. The desirability of UMT from a Guard standpoint is somewhat different than the approach of some of the other components, because we believe that through voluntary recruiting we can recruit many more individuals than we have already obtained. But we appreciate very deeply that recruiting has always been a tremendous problem in the National Guard,



**The 28th Infantry Division, Pennsylvania National Guard, marching down the Champs Elysees in the Paris Victory Parade.—Army Signal Corps photo.**

1,500 additional, we may then move the Guard out into communities where it has not previously existed. By so doing, we open up a considerable recruiting field not presently available to us. Many of The Adjutants General tell me that if that is done, and additional armories acquired, we can come very near to recruiting the entire troop basis. I am not quite that optimistic, but at least we can go a very long way.

Then, of course, we are confronted with and even should we succeed in recruiting every last one of the 682,000 men presently allotted to the Guard, we would still be faced with a continuous recruiting effort to maintain that strength. Recruiting would be a problem in the first instance, or if not a problem in the first instance, it would be a continuing problem of great magnitude.

UMT impresses me as being highly desirable for the National Guard from another approach, and that is from a

training point of view. Graduates of UMT will have five times as many hours of military training as we are able to provide in a year. That means they will come to the Guard with their basic training complete, with some training in minor tactics, some technical and specialist training; and we can then train from that point forward, which will be more a matter of organization training. Under such circumstances, the Guard would more nearly approach the successful accomplishment of its M-day mission than if it continued on its present basis.

Achievement of that goal, development of the National Guard into an M-day Force at or near full strength, will mean much to the security of the United States.

### Realistic Defense

It is generally concluded that if we have another war it will be heralded by

**Peacetime training in 213th AAA Group, Pennsylvania National Guard.**

an unannounced attack directed against the United States; and that it will take the form of an atomic bomb attack, airborne invasion or guided missiles from offshore vessels, or any combination of these.

The impact of this type of warfare against our densely populated areas, the homes of our people, our strategic areas, the factories so essential to our livelihood and our national defense, our communications systems, our magnificent public buildings, would be too terrible to contemplate. Only those of us who are truly aware of the destructiveness of war can visualize it as do those of us who have witnessed Hiroshima.

How would the projected organization of the National Guard assist us in meeting such an attack? The approach of an invader would be detected by the long-range radar of our Aircraft Control and Warning units, such as those which are to be established in Alabama, North Carolina, Lousiana and Texas.

Our fighter aircraft would be sent aloft to intercept the enemy. Our anti-aircraft artillery would defend important installations with their gun battalions firing against high-flying enemy aircraft and the fire of their automatic weapons battalions directed against low-flying craft. Our fast-moving, hard-hitting infantry would deal with any enemy that might succeed in touching foot on our soil.

By its very nature, the National Guard offers the most practical and realistic defense that can be devised. It is organized in the several States, and its units are dispersed throughout the countryside. A knockout blow in any given area would put out of action only those troops immediately concerned. The troops not affected could mobilize immediately under their own alert plans and act as the situation demanded.

The benefits of decentralization in such a situation are obvious, since they could act immediately and they would not have to await orders from a centralized authority in Washington, which might itself be heavily attacked.

After the initial defensive phases of such a war are past, the National Guard would then, as always, move out against

the enemy wherever he might be found.

**Not Changed by Unification**

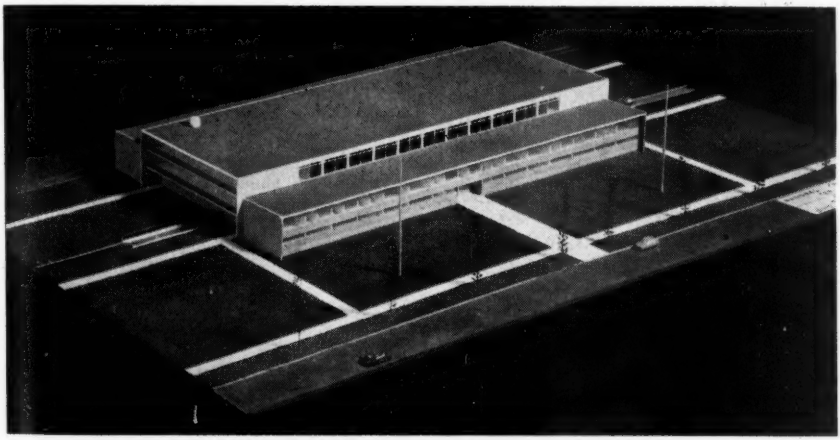
There has been no change in the status of the National Guard Bureau under the Armed Forces Unification Act signed by the President 26 July 1947. It remains under the Secretary of the Army, but matters relating only to Air units of the National Guard are subject to review only by the Air Staff but not by the Army General Staff.

The National Guard of each State is under the command of its Governor in time of peace. Collectively, however, the National Guard of the United States is integrated into the national defense plans of both the Army and the Air Force. It will be called upon to furnish nearly as many troops for the M-day Force as the Regular Army itself, and its Air units will furnish twenty-seven Tactical Groups to the Air Defense Command if called into Federal service for an emergency.

The national defense is the responsibility of every American citizen. Soldiers of the Regular Army, the Organized Reserves and the National Guard are discharging their responsibility through their service in these components and through their cooperation with the other components. The general public also is becoming more cognizant of its responsibility and is beginning to give its earnest support to the national security.

With that continuing support, the National Guard will strive to make of itself an M-day Force, fully prepared to take its place with the Regular Army and the Organized Reserves whenever an enemy strikes.

But more important, an enemy will hesitate to strike at a prepared America. Thus, in building toward an M-day Force, the National Guard will fulfill its slogan, "Your National Guard Helps Guard the Peace."



**Model armory designed for the post-war National Guard.**

# Guerrilla Operations in Northern Burma

Lieutenant Colonel W. R. Peers, *Infantry*
Instructor, Command and General Staff College

*This is a first-hand account of the operations of Detachment 101, Office of Strategic Services, with the native Kachin tribe guerrillas in Northern Burma. Lieutenant Colonel Peers served as Operations Officer, and then as Commanding Officer, of Detachment 101, and his experiences bear out the conclusion that "guerrilla activities do have a place in modern combat." The concluding article will appear in the July issue of the MILITARY REVIEW. — The Editor.*

### Introduction

GENERALLY speaking, guerrilla activities are designed to harass the enemy in his rear areas by attacking his personnel, destroying his installations, and disrupting his lines of communication. If properly organized and directed, guerrillas have a decided effect upon the enemy's tactical operations. They cause the enemy to employ combat troops to guard his rear areas and thereby reduce his effective fighting strength at the front, and they likewise make it difficult for him to move his reserves. The value of guerrilla operations as a part of total war was recognized during World War II and resulted in the development of such activities in nearly all enemy occupied countries of both major theaters, European and Asiatic. Guerrilla activities did not win the war, as sometimes claimed, but they did play an important part in its final outcome. The following is a historical example of what was accomplished in Northern Burma.

### Burma Background

The population of Burma is composed of many different national groups, nearly all of them of Mongoloid ethnic extraction. These groups are sharply divided by differences in tribal customs and by the fact that the spoken language is split into more than 250 separate dialects. The main groups in Burma are the Burmese, Shans, Karens, and Kachins, in that order of descending population numbers. All but the Kachins, Shans, and Burmese are unimportant to us. (See Chart I.)

The small but warlike group of Kachins descended upon Northern Burma in the Thirteenth Century by way of Tibet. They evicted the Shans and a few minor races from the hill tracts, but the Kachins lacked sufficient strength to overrun the fertile lowlands and plateau areas. As a result, from that day to this, the Kachins have remained predominantly a hill tribe, although they have always looked with a longing eye to the agriculturally rich bottom lands, and have developed a continuing hatred toward the Burmese who live there.

The Kachin population is roughly 300,000, spread over an area approximately 150 miles long by 300 wide, lying along the north and northeast border of Burma adjacent to China. The average Kachin is a hardworking, industrious, and trustworthy individual, although quite primitive and lacking in education. Their tribal organi-

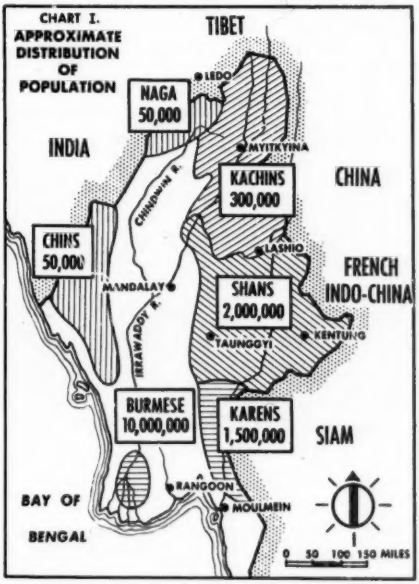
zation is similar to that of our own American Indian—subdivided into seven main tribes, each with its own dialect. The men spend the greater part of their time hunting and fishing, and they are as much at home in the jungles as the ordinary American would be on the main street of his home town. Their sense of direction and junglecraft is uncanny. Each man carries a long knife, called a *dah*, which is most efficient for close-in fighting. The Kachins have a keen interest in firearms. Some of them have fashioned their own blunderbusses and manufactured their own powder and ammunition. Many of them have served in the Burma Army. All in all, in his jungle, the Kachin is a good man to have as a friend and a poor choice as an enemy.

The Burma-China border has been the scene of a continual series of border incidents. The British realized the value of the Kachins as a buffer group between Burma and China and had done much toward improving their standard of living, education, medication, and government. The Kachins, always appreciative of anything that is done for them, gave the British their full support and loyalty.

Guerrilla activities usually develop because of a strong motivating force, such as love of country or reaction to oppression. The Burmese of the lowlands were not anti-British, nor were they pro-Jap; they were basically pro-Burman. They looked upon the Japs as a means of gaining self rule, and boarded the band wagon. The Japanese did not mean much to the average Kachin, but when the Japanese and Burmese banded together, the age-old hatred of the Kachin toward the Burmese, coupled with his loyalty to the British, caused him to be violent in his hatred and resistance to the Japanese. After the Japanese occupation of Burma, the Kachins continued to resist, although this resistance was sporadic and lacked organization and equipment. They suffered at the hands of the Japs in the form of burnt villages and mass reprisals, but they never veered in their efforts. Development of guerrilla activities using the Kachins was a natural; the Kachins had the knowledge of the jungles and the will to resist, while direction, leadership, arms, ammunition, and the communications equipment could be supplied to them.

### Organization of the Unit

The possibility of developing guerrilla resistance within such groups was recognized by General William T. Donovan, then chief of the predecessor organization to the "Office of Strategic Services." In the early part of 1942, he suggested to General Joseph W. Stilwell, China-Burma-India Theater Commander, that an organization be created to conduct such activities. General Stilwell was well familiar with the capabilities of guerrillas through the activities of the Japanese-inspired fifth



columnists during the humiliating defeat of the British, Chinese, and American forces in Burma, and was willing to give it a try. However, both men recognized that such activities could be valuable only in so far as they were planned and coordinated with existing and future military operations. Because of the acceptance of this principle, perhaps the outstanding characteristic of guerrilla operations in Northern Burma was the close coordination of these activities with regular military operations, both ground and air. All guerrilla plans, from the over-all concept down to the tactical plans of the smallest units, were made with this in view. This

**Two Kachin recruits examine their new weapons.—Army Signal Corps photo.**

required guerrilla personnel to understand regular military operations and conversely, the military personnel to know the capabilities and limitations of guerrillas.

The unit formed was designated OSS Detachment 101. It was designed to carry on all of the various activities conducted by the Office of Strategic Services, including espionage, sabotage, and guerrilla action. Here we will deal only with guerrillas, and refer to the other activities only as may be necessary to show the relationship of one to another. Detachment 101 was organized, trained, and equipped in the early part of 1942 and arrived in the CBI Theater about the middle of that year. The initial personnel numbered only twenty, each officer or enlisted man having been selected for his operational, administrative, or technical qualifications. This group later grew into a unit of approximately 750 officers and enlisted men.

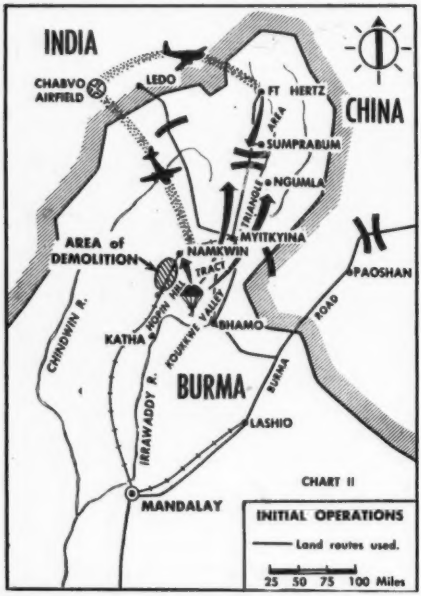
General Stilwell's plan was to drive the Japanese out of Northern Burma, and to build a road from Northeast India across Northern Burma to tie into the old Burma Road, and thus open a new "life line" to China. Accordingly, the first mission given to Detachment 101 was, briefly, "to establish a base in Northeast India and from there to conduct operations to deny the Japanese the use of the Myitkyina airfield, to include attacks on the roads and railroad leading into that area from the south." Since Burma was a British possession, instructions also included the establishment of an effective liaison system with British authorities to the end that no possible cause for mutual interference should arise.

The remainder of 1942 was spent in locating and establishing a base camp in the tea-garden area of Assam in Northeast India; in recruiting personnel from the refugee camps, the Burma Army, and the Burma Navy; and finally, in training these individuals for the type of field work they would be performing. One of the first problems to be solved was the development of a radio set with a range over 500 miles, portable, self-powered, and capable of operating under monsoon conditions in jungle and mountainous terrain. The radio technicians of the unit constructed such a set from parts taken from standard army signal equipment and from parts purchased on the local Indian market. The completed set with power pack weighed less than fifty pounds and far surpassed the minimum qualifications. The success

**Groups of American-trained Kachin tribesmen (such as shown above) were transported by air and parachuted into the scene of guerrilla operations in Northern Burma. On the ground the guerrillas engaged in forays behind the Japanese lines (lower left), or took part in such operations as those in the Hukawng Valley (lower right).**

of this project was attested by the fact that after nearly three years of operations several of these sets were still in use.

Personnel forming the nucleus of the detachment had been well trained and had excellent military backgrounds, but none of them had ever participated in guerrilla operations or were familiar with this part of the world. Consequently, the initial operations were based necessarily upon trial and error in order to convert the




principles of guerrilla operations, as taught in the OSS schools in the United States, to actual techniques which would be applicable to this area. Each operation was planned in as much detail as possible. During the operation, records were maintained down to the smallest detail, and on completion the operation was studied and analyzed to determine its strong points and its weaknesses. Good points were incorporated in unit training, while weaknesses or errors were corrected. This procedure continued throughout the entire period of operation and resulted in the development of sound and efficient operating techniques.

### Initial Operations

The Detachment's initial operations are good examples of the trial and error process, and illustrate the primitive nature of early operations. The first operation was an attempt to infiltrate a group through the Japanese lines north of Myitkyina to attack the roads and railway leading into the area and to determine the attitude of the people. (See Chart II.) The group was composed of selected officers and other ranks from the Burma Army and Navy. They were flown to the Fort Hertz airfields in the northern tip of Burma, where they established contact with the local British commander directing the activities of the Kachin Levies, an irregular force of natives created by the British to harass the Japs in that area. The operation was both a success and a failure; it was found that the Jap lines could be infiltrated and that the people were friendly although fearful of reprisals, but it was also found that the time required to traverse extensive reaches of jungle and mountainous terrain would be too great for the men to get out before the monsoon. The group, augmented by four native guides recruited in the area, was flown back to India and re-equipped.

Since the monsoon season was approaching, it was apparent that the only way to get the men in the immediate area of their operating zone was to deliver them by air. As an illustration of local coordination and cooperation arising out of necessity, the arrangement made between Detachment 101 and the Air Transport Command is a good example. The ATC was losing crews over its India-China route and had no way of recovering them. Operations to recover this personnel could be undertaken by the detachment, so, after consultation, it was agreed that the ATC

would furnish the necessary airlift, parachute equipment, and parachute instructor personnel, and that Detachment 101 would develop operations with a view toward air crew rescue, and would further assist the ATC in their jungle survival training.

One interesting problem which developed during the basic ground parachute training of the initial group was that of devising a method of getting non-English speaking native personnel out of the plane and safely on the ground. The process evolved was to drop them in groups of five with the strongest and most eager individual at the rear to serve as a pusher, and to use twenty-five foot lengths of half inch manila rope as static lines from the release handles to the aircraft. In spite of the quick improvisation and the risky procedures, the first airdrop operation went off without a hitch and all the men landed safely with their equipment in a jungle clearing in the Koukkwe Valley, about eighty miles south of Myitkyina.

The group organized a base camp and established communications with the base in India, and then proceeded by night marches across the Hopin Hill Tract to reach the railway corridor in the area of Namkwin. There the group was split into two parties. The first party planted approximately thirty charges with variable time delays along the railway to the south, while the second dropped two spans of the railway bridge into the Namkwin River. The second party encountered a Jap patrol which killed one of its members and delayed it for several days by pursuit. The first party returned to the base camp, and thinking the other party was captured, broke camp and moved across the Irrawaddy River to continue operations along the Myitkyina-Bhamo road. On its arrival at the former site of the base camp the second party was without food and in a serious predicament. Fortunately it was located by an air search mission which dropped a week's emergency rations. Succeeding drops were unsuccessful as invariably the men were off in the jungle when the plane arrived. They finally decided to attempt to march out to the north by way of Myitkyina. Their food was obtained by raiding Jap supply dumps and by living off the land. It required them approximately two months to cover the 250 miles to Fort Hertz, although they were not much the worse for wear.

While this operation was being conducted, an American major with a small

**Bridge sabotage by Kachin guerrillas in the Mogaung Valley.**

group of natives and communication personnel had infiltrated the Jap lines and established a base at Ngumla in the center of an area known as the Triangle. His mission included obtaining military intelligence and developing a small guerrilla force for sabotage, ambushing, and other harassing activities.

The first party of the initial operation continued to operate along the Myitkyina-Bhamo road for another two months and was then directed to make its way to the base camp at Ngumla and so on to Fort Hertz and back to India.

These operations were relatively insignificant in comparison to the over-all operational results of the detachment, but they were a beginning and a tremendous

amount of knowledge was gained from them. As was to be expected, many errors had been made and the training had to be adjusted accordingly. In addition, certain conclusions were drawn regarding the future operational activities of the detachment. A few of the more important were: (a) that guerrilla operations should be developed along the lines of small mobile units; (b) that nuclei for native guerrilla units should be infiltrated through the Jap lines and flown to India for detailed training in American weapons and the tactics and techniques involved therewith, and that these men, along with the necessary arms, ammunition, and communications equipment should be dropped back into their original area to organize and train small guerrilla forces; (c) that due to time and space factors all future operations should be based on air drop and air supply, and all techniques concerned therewith should be improved and standard American paratroop equipment be procured; (d) that although the radio set developed for field operations was excellent from the point of view of distance and the handling of limited traffic, it was not satisfactory for the large volumes of traffic of the field base station; therefore, additional semi-portable, high powered, and motor driven equipment must necessarily be installed at the field bases; (e) that an adequate system of medication be developed in the field, that a hospital be constructed at the base camp for the treatment of serious guerrilla casualties, and finally, that a system be developed to evacuate patients from behind the Jap lines to the base hospital.

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**We know that modern war is total war. It demands conversion of our entire economy into a coordinated war effort. It involves the total national resources and requires the coordination of military, industrial and civilian mobilization.**

*General Jacob L. Devers*

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**Never before has our military strength been more dependent on the strength and readiness of the National Guard. In any emergency not only would the Guard have to step in and replace regular units directed to new emergency missions but also it would have to carry the burden of internal defense as well.**

*General J. Lawton Collins*

# Planning for Concerted Action in the Air-Ground Effort

Major Walter A. Smith, *United States Air Force*
Instructor, Command and General Staff College

"SUNSHINE, this is Magnet Red, approaching your position at 8000 on a course of ninety-five degrees, over."

"Magnet Red, this is Sunshine. Have you in sight; your target is a group of armored vehicles three miles east of my position. To your left you can see an 'S' shaped road leading into a wooded area. Your target is in that woods. To your right, on the north edge of the woods, is a partially destroyed stone farmhouse. Suggest you attack from north to south to avoid intense AW fire. Give me a call as you approach the target, and I will instruct the artillery to place counter-flak fire on these batteries. This is Sunshine, over."

"Sunshine, this is Magnet Red, Roger."

With these instructions from Sunshine (the Forward Air Controller), Magnet Red (the attacking flight of fighters) positions itself to deliver the attack.

But before this attack could take place, there had to be a plan; an Air-Ground plan.

In order to integrate the air effort and the ground effort in a common mission, directed toward a common objective, conceived and executed concurrently, each complementing the other, it is necessary that there be a method for achieving this unity of effort. The air force and the ground force are employed in joint operations as components of an air-ground team.

Unity of command exists in the theater commander, and parallel levels of command, extending through army group—tactical air command and army—tactical air force, coordinate in planning and cooperate in the execution of joint operations.

Coordination and cooperation begin with the initial planning and continue throughout the operation. They are integrated at that command level which best produces the desired results from the available air and ground forces. It is apparent that to provide rapid communication, flexibility and control it is essential that these operations be conducted at the lowest possible echelon of command. Since the tactical air force is the lowest echelon of the air forces which plans and conducts independent operations, and the army is the basic unit of strategic maneuver, the army and the tactical air force form the fundamental air-ground team.

The greatest asset of the air force is its flexibility and its ability to operate in mass. In order to preserve these attributes, control is vested in an air commander who is the partner of the ground commander. In order to achieve unity of effort, we must begin to integrate the air plan and the ground plan when the idea for the operation is conceived. Broadly speaking, there are two types of plans—preliminary planning and operational planning.

### Preliminary Planning

Preliminary planning is that which takes place prior to the operation and is performed concurrently at all levels. The initial plan may be received from a higher headquarters and will include a statement as to the mission to be performed by the unit receiving the direction. Those considerations in the air plan to be dealt with in the preliminary planning stages include the initial decisions which may be required; determination of the degree of air superiority required, and the extent of the areas over which this condition must prevail; the battle area to be isolated, its location, extent and the length of time essential to the success of the ensuing operation; the amount of reconnaissance required by both air and ground and the amount of air effort which will be available and which will be necessary to accomplish the mission. With these basic decisions arrived at, a general plan of employment may then be conceived.

Preliminary planning may occur at the army—tactical air force level or higher. In special operations, it may be performed at the corps level by delegating a special planning staff from the air force to cooperate with the corps planning staff in arriving at those initial decisions which must be made. Operational planning normally is conducted at the army—air force level.

The tactical air force is organized and equipped to function in conjunction or in cooperation with the field army. Likewise, the army is so organized to be able to operate in coordination with the tactical air force. On the staff of each headquarters are those officers who have for their specific duties the coordination and the integration of the air-ground plan. It cannot be emphasized too strongly that this integration of planning is a continuing process, brought about by the constant daily contact of these particular staff officers.

### Operational Planning

This day to day operational planning is accomplished in the Joint Operations Center, a composite organization made up of the Combat Operation Section of the air component, and the Air-Ground Operation Section of the ground component. The army is represented by a G-2 Air and G-3 Air, and the air force by the A-2 and A-3. These officers and their places of business are actually located adjacent to one another and the best of communications cannot replace this close association.

There are usually two periods in every day, however, in which these contacts are summarized, and in which the entire command, both air and ground, is brought up to date as to the joint action which is taking place or is contemplated for future activities. Usually one such conference is held each morning and one each evening.

At the morning briefing, both the air and ground commanders and their staffs are thoroughly familiarized with the results of the preceding day's operations and with the current air and ground plans. At this briefing the G-3 of the army describes the ground operations of the previous day, locating the existing front lines of the current operation. The army G-2 presents any additional information of the enemy forces which has been developed since the preceding conference. The air force A-2 then describes the results of the air operations of the preceding day and the scale of enemy operation.

The Air Force A-3 follows with operations to be conducted during the course of that day.

At this meeting the air and ground commanders will often announce a plan or directive for near future operations which may have been preconceived or developed as a result of the presentations made at the morning briefing.

### Evening Target Conference

At the close of the day's operation

another conference is held which is called the evening target conference. It is here that the day's activities of coordination are crystalized and the plan for the next day's operations evolved.

Examining a typical agenda for an army—tactical air force evening target conference, the following presentations are revealed. Because all air operations are largely predicated on weather, the air force weather officer will be the first to make his presentation and it will be a synoptic situation with a forecast for the following day. The intelligence section next presents a summary of the day's operations consisting of both air intelligence and ground intelligence. An assistant A-2 reports on the results of the air missions flown during that particular day and further presents proposed photo reconnaissance missions for the next day from an air force standpoint. Another member of the A-2 staff follows with a summary of the air situation and new items of air intelligence concerning the activities of the enemy air force.

Continuing the intelligence presentation, the Army G-2 is next with a summary of ground intelligence relating specifically to air operations. Upon completion of the intelligence presentation, the Army G-3 describes the ground actions of the day and a brief plan for the activities contemplated for the next day. In his plans he will indicate priorities for air missions; those units which are to make the major effort will naturally receive higher priority in so far as air support is concerned. The G-3 Air follows the G-3 and presents the request for planned missions in order of priority. These will be targets which units in contact with the enemy have requested to be hit sometime during the next day's operation, and it is here that the armored bivouac attacked by Magnet Red would be discussed.

The Air Force A-3 follows the G-3 Air and announces the air force commitments such as bomber escort, counter air force missions, armed reconnaissance and other definite air commitments which will reduce the available air effort to be directed toward close support missions. The A-3 then presents his plan for the next day's operation including his acceptance or rejection of ground request missions as presented by the G-3 Air. The air force commanding general will then approve the plan as presented, or as amended by himself, or he may disapprove it in its entirety, necessitating the development of a new plan. Once the plan is approved, the field order to the air unit is written and dispatched to them as soon as possible.

For the G-3 Air, who is concerned with request targets, the highlight of this meeting occurs when the G-3 announces the priorities for air assistance, and when the A-3 indicates air force availability.

It must be borne in mind that the evening target conference is simply the crystalization, the formalized presentation of all items which have been coordinated during the progress of the day. Obviously, it would be impossible for the G-3 Air to present his order of priority immediately following the announcement of a priority for air assistance by the G-3, and immediately preceding the A-3's announcement of air force availability. Necessarily, these items must be worked out prior to the presentation at the evening target conference. All of these factors have been coordinated prior to that meeting. The plan is evolved to the mutual satisfaction of the air-ground team.

"Sunshine, this is Magnet Red. We got seven direct hits on tanks, and several other vehicles are now on fire. Mission completed. Magnet Red, out."

# The Military Railway Service in Italy and Northwest Europe

Major General Carl R. Gray, Jr., *USA*
Director General, Military Railway Service, in World War II.

*This is the second of two articles on this subject by General Gray, who recently succeeded General Omar N. Bradley as the Administrator of Veterans Affairs. In the first article, which was published in the May issue of the MILITARY REVIEW, the author discussed the development of the Military Railway Service through the invasion of Sicily.—The Editor.*

THE invasion of Italy by the Allied Forces brought a further extension of the authority and responsibilities of the Director General, Military Railway Service.

The orders governing the operation of military railways in North Africa were continued in general, but were amplified, on 22 October 1943, by General Orders No. 60, AFHQ (Allied Forces Headquarters).

Under this directive, the Director General became responsible for the rehabilitation, technical development and operation of all Italian State and privately owned railways, except for those portions which might be returned to civilian operation under supervision of the Transportation Sub-Commission of the Allied Commission.

All United States Railway Service Troops, the Railway portion of the British Transportation Service, and Italian Railway personnel and material came under the Director General's disposal, and operated under his direction.

General di Raimondo, and all of the Italian military railway organization, were ordered to report to the Director General to carry out the duties assigned them. Reconstruction and operation of the Italian Railways was governed by priorities established by AFHQ, which was represented on the Italian mainland by the Deputy Chief Administrative Officer of the Advanced Administrative Echelon, AFHQ.

Additional British Transportation troops of both Railway Operating Groups and Railway Construction Groups were brought to Italy from Egypt with the invasion forces. Units of the Military Railway Service (U.S.) were transferred from North Africa and Sicily to support the U.S. First Army. The British troops supported the British Eighth Army, but all were under the general direction of the Director General.

The latter opened his first headquarters in Naples and subsequently moved it to Rome in July, 1944.

Development of operations in Italy made it necessary to enlarge the powers of control of the Director General, and this was done by General Orders No. 19, dated 5 August 1944.

By this order, the Director General became responsible for advanced planning and development of railways to support the operations under the direction of the Supreme Allied Commander, Mediterranean Theater of Operations; for the distribution of available resources of person-

nel and equipment; for reconstruction and operation of all railways in the zone of operations, except those returned to civilian control; and for technical advice on all railway matters.

To assist the Director General in fulfilling his mission, all U.S., British, and Italian railway personnel were placed at his disposal and operated under his direction. All railroad material was placed at his sole disposal.

To insure the proper fulfillment of these responsibilities, I was also directed to establish a headquarters at AFHQ, with whom I was to keep in constant touch. Executive deputies for the Director General were provided for, and immediate appointment of such deputies was ordered for Headquarters, Allied Armies in Italy and Headquarters, Seventh Army.

Under this order, the Director General reported directly to the Chief Administrative Officer, AFHQ, and was relieved of all responsibilities for railway operation or construction in North Africa.

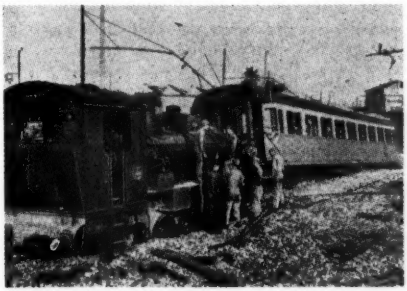
A North African Theater of Operations circular, dated 10 August 1944, specified the Military Railway Service, Allied Forces, as a major command.

The invasion of Southern France made it advisable to relieve the Director General of responsibilities in North Africa, Sicily and Italy, and this was done by General Orders No. 22, 25 October 1944, AFHQ. Under this order, Brigadier R. D. Waghorn, of the British Engineers, became director in Italy, and Lieutenant Colonel William P. Wilson, U.S. Transportation Corps, became deputy director. The new Director in Italy had no responsibility for railway operation or construction in North Africa or the south of France. In North Africa, the local commanders became responsible for arranging with the French for British and United States rail movements.

Consequently, as of 26 October 1944, I took up the rehabilitation and operation of the railroads in Southern France under the direction of Headquarters, Sixth Army Group, and there was issued on 30 October 1944, a railway plan for this new area.

This plan set up priorities for placing the military railways in operation, following the advance of the Armies. First priority was given to Seventh Army, along the route: Epinal—Blainville—Luneville—Saarburg—Strassburg; and to the First French Army, along the line: Vesoul—Lure—Belfort—Mulhouse. Second priority was given Seventh Army from Epinal to St. Die, and Strassburg.

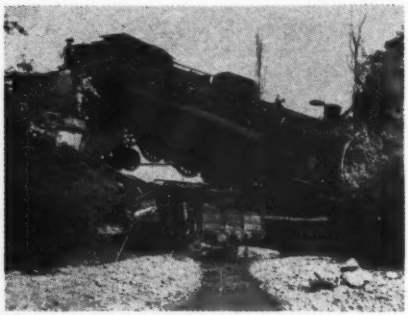
Rehabilitation of the military railways within the army area was the responsibility of the Military Railway Service, and assistance by Engineer General Service troops for this purpose was made available through the Commanding Generals of the Armies. Rehabilitation of military railways by Army Engineer Troops was under the general supervision of the Military Railway Service, which established standards of construction and directed and controlled the use of special railway bridging and other materials. While maintenance of railways in operation was made entirely a responsibility of the Military Railway Service, the guarding of bridges and other essential structures was a responsibility of the Army concerned.



**Wreckage found by U. S. military railroad troops at Naples, Italy.**

The method of handling the Military Railway Service responsibilities was changed again by general orders on 16 January 1945, with the organization of the First Military Railway Service, of which I was designated the Director General, effective as of 20 December 1944. The First Military Railway Service was assigned to the Southern Line of Communications, ETOUSA.

Besides being responsible for the usual planning, development, reconstruction and operation of the railways, the First Military Railway Service had to stock and issue all railway track material for heavy construction and ordinary maintenance in the area supported by the Southern Line



**Locomotive wrecked by Germans on bridge in Southern France.**

of Communications. All United States railroad property was at the sole disposal of the Director General, and he commanded, for operations and administration, all personnel and units assigned or attached to the First Military Railway Service. Supply of units of the First Military Railway Service was an automatic responsibility of the Advance or Base Section in which a particular unit was located.

This procedure was followed until 6 February 1945, when ETOUSA and SOLOC were consolidated into COMZONE ETOUSA.

The program for handling Military Railway Service matters pertaining to the rehabilitation and operation of the railroads in the invasion of Northern France was set forth in Administrative Memorandum No. 24, of Supreme Headquarters, Allied Expeditionary Force, on 18 July 1944.

The principle on which the program operated was to re-establish the normal French system of control, maintenance and operation, as soon as French resources were sufficient, but always subject to retention of control by British and United States military authorities over movement and allocation of technical resources to insure that military requirements would be met.

In each area liberated, it was considered likely that there would be three stages of development.

In Stage I, there was to be British and United States military control, development and operation, with the assistance of French liaison officers and civil technicians.

British and United States authority was to continue in Stage II, with assistance of such French agencies as might be re-established as "coherent organizations." There was to be a progressive delegation of functions to French agencies, under British and United States direction, during this stage.

In Stage III, the French would assume responsibility for maintenance and operation, with British—United States requirements being communicated through commissions.

Procedures were set up for each stage, to govern movement control, and transportation.

In addition, there was set up by SHAEF an Inter-Allied Railway Commission, which was constituted by Administrative

Memorandum No. 28, dated 27 August 1944.

The commission included representatives of the United States, Great Britain, and France, with the Director General of Military Railways, SHAEF, as the initial chairman, and at a later stage under a French representative. Initially the commission was established at Rennes.

This commission was responsible for advising SHAEF and the French Provisional Government on all questions of policy affecting the railways of France. It was also responsible for recommending the dates for the progressive changes in the stages referred to in Administrative Memorandum No. 24, the areas in which the stages would apply, and the reestablishment of the French railway set-up.

In view of the fact that the Director General's assignment was changed to cover all of the operations in France, it became necessary to reconcile and to change some of the responsibilities of the Director General, Military Railway Service, as set forth in SOLOC General Orders No. 3, of 16 January 1945, with the provisions of Administrative Memoranda Nos. 24 and 28. The assignment of the Director General to these enlarged responsibilities was made by General Orders No. 16, SHAEF, on 6 February 1945.

Ten days later, on 16 February 1945, a General Headquarters, Military Railway Service, COMZONE ETOUSA, was authorized. It was composed of twenty-seven officers and seventy-three enlisted men.

There followed on 3 April 1945, a Standing Operating Procedure No. 32, issued by Headquarters, ETOUSA, which prescribed the procedure for the construction, maintenance and operation of all military railroads in the United States areas on the European Continent.

Provisions of this SOP show how the Military Railway Service operated at this time. Construction of railroads was the responsibility of the Engineer Service, under the technical supervision of the Chief Engineer, Communications Zone. The Chief of Transportation, Communications Zone, operating through the Director General, was responsible for the maintenance of way and equipment, and the operation of railroads followed the same line of responsibility.

Under the provisions of the SOP, the Military Railway Service, with its attached units and personnel, was an exempted command responsible to the Chief of Transportation, Communications Zone, with the exception that the various Communications Zone Section Commanders exercised administrative authority over Military Railway Service units and personnel within their respective sections.

Boundaries of Grand Divisions and Divisions of railroads were prescribed by the Director General, and neither the Director General nor any subordinate commander of the Military Railway Service could be charged with area command.

It was specifically stated that the railroads would be operated as prescribed by the Director General, in conformity with policies laid down by ETOUSA and higher headquarters.

Rehabilitation of railroads remained one of the major problems of the Military Railway Service, and in Circular 31, on 13 April 1945, ETOUSA undertook to define and decentralize the responsibilities for this work within the theater.

Among the policies laid down at that time, the Director General was made responsible for selecting the main railway lines of communications, subject to the concurrence of the Commanding Generals of the Sixth and Twelfth Army Groups, and Headquarters, ETOUSA. The Director General was charged with providing a plan of the lines. On acceptance of rehabilitated lines, the Director General

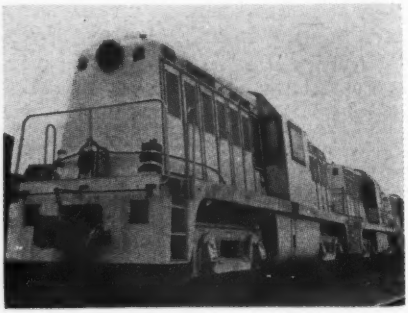
became responsible for maintenance and operation.

The General Manager, 1st Military Railway Service, was responsible for completion of all approved railways and additional construction required for initial operations in support of the Sixth Army Group.

The Commanding General, Advance Section, was responsible for the completion of all approved railways supporting Twelfth Army Group, and the United States forces operating with Twenty-first Army Group.

This circular on rehabilitation also stated:

"In the support of the armies, it is intended that Advance Section and 1st Military Railway Service have great latitude of action and no approval from this headquarters will be required except for major departures from approved general plans or when new commitments of far reaching nature are undertaken. Rehabilitation of other rail lines, undertaken within the scope of this authority, will not be accomplished at the expense of the principal network which will be considered first priority."



**Diesel locomotive, 65-tons, built principally for the European Theater.**

Further implementation of the rehabilitation program was provided in Staff Memorandum No. 6, ETOUSA, 14 April 1945, which defined the responsibilities of the Chief Engineer, Communications Zone, and provided that all matters of controversy concerning boundaries, labor, priorities, and proposed plans of "far-reaching nature," would be referred to the Assistant Chief of Staff, G-4, for final action.

Under these authorities and responsibilities, the logistical supply by rail to the Armies of SHAEF, namely, the Sixth and Twelfth Army Groups, and to the troops under the Commanding General, Theater Service Forces, ETOUSA, continued through 25 October 1945, when Headquarters, Military Railway Service, was relieved of duty and returned to the United States.

The Director General, on assumption of duty, 12 February 1945, had divided the European Theater into two areas, North and South, separated by a line approximately from Cherbourg through Paris, Coblenz, Bebra, and Leipzig. All railroads south of that line were under the jurisdiction of the General Manager, 1st Military Railway Service, with headquarters at Lyon and subsequently at Strasbourg. All railroads north of that line up to the Southern boundary of the Twenty-first Army Group, were under the General Manager, 2d Military Railway Service with headquarters at Brussels, Belgium.

The Director General's forces had been augmented by troops from the United States and consisted of the following: One General Headquarters, Military Railway Service; two Headquarters, Military Railway Service; seven Railway Grand Divisions; twenty-four Railway Operating Battalions; eight Railway Shop Battalions; one Railway Transportation Company; two Base Depot Companies; five Railway Workshops (Mobile) and ten Hospital Train Maintenance Sections.

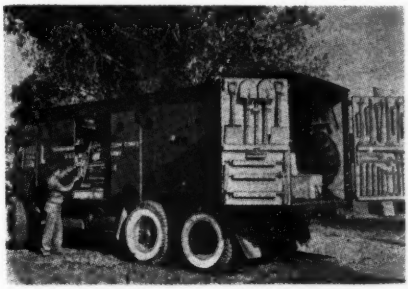
Beginning in North Africa in the summer of 1943, and continuing through North Africa, Sicily, Italy, Southern France, and ultimately throughout the European Theater, the Director General assumed responsibility for the security of railroad property and goods in transit. This responsibility was met with Military Police Battalions assigned to his command for that purpose. By VE-day, then, in France, there were in addition to the sixty Military Railway Service units above enumerated, a total of fourteen Military Police Battalions assigned in the Military Railway Service. The force actually consisted of approximately 37,000 officers and men, in seventy-four units.

At the beginning of this discussion, I intimated that there were a great many deviations from approved practices in the handling of the Military Railway Service in World War II, and I should like to point out specifically what they are and briefly explain them.

Field Manual 55-50, "Military Railroads and the Military Railway Service," published 27 March 1944, indicates that the General Manager of the Military Railway Service reports through the Chief of Transportation to the Commanding General, Army Service Forces, and to the Commanding General, Theater of Operations.

Possibly I am a prejudiced witness, but I firmly believe that the Military Railway Service should be a separate major command, as it was under the terms of Circular 90, NATOUSA, and that the Director General should report directly to the Theater Commander. The operation of railroads is a highly technical profession and only men who have spent their lifetime in it understand it and can handle it. The Theater Commander, laying down rail transportation requirements, would then leave to his Director General the technical handling and the technical details of successfully carrying them out. Any intermediate commander, not trained in railroad operations, has a tendency to interfere with and nullify the operation of the railroads.

Then too, it is my firm belief that the Director General should be charged with the rehabilitation of railroads, as well as their maintenance and operation. That function can only be exercised properly when the Military Railway Service is a separate major command. The engineering profession has many highly technical phases, and possibly the railroad engineering picture is least known to engineers as a whole, except to those who engage in the railroad profession. A thoroughly competent engineer cannot rehabilitate railroad bridges and track structures, even though he can build wagon roads, roadways, and buildings superbly, because it takes experience and long training to be able to give line and surface to track and to build railroad bridges under traffic conditions.



**Mobile repair shop of Military Railway Service.**

Therefore, following this line of thought, it is believed that the provisions of Administrative Memorandum No. 4 and subsequent authorities and directives issued by the Mediterranean Theater will give better results than were obtainable in ETOUSA where the work was divided

between the Military Railway Service and the Corps of Engineers.

I believe that the Chief of Transportation should be charged with the flow of traffic and that he should indicate what percentage of the total traffic to be moved shall be moved by rail, truck, air, and waterway. But I do not believe that anyone but the Director General and his forces should be charged with the responsibility for rehabilitation, operation, and maintenance of railroads in a Theater of Operations. I thoroughly agree with the provisions of that order of the Secretary of War in 1862 which specified "that no officer, whatever may be his rank, will interfere with the running of the cars as directed by the Superintendent of the road and that anyone who so interferes will be dismissed from the service for disobeyance of orders."

The Military Railway Service is organized with high echelons of experienced railroad construction and maintenance officers who know how to repair and maintain track and engines, and I see no difference between rehabilitating engines and cars or rehabilitating track, bridges, and buildings. The responsibilities for that should not be divided, but should be placed strictly and securely on the shoulders of the Military Railway Service and its experienced railroad engineer officers.

I likewise believe that the only way to protect against thievery of shipments over the railroads is the plan developed and utilized by us throughout the entire campaigns in the Mediterranean and European Theaters, namely, to assign to the Military Railway Service sufficient battalions of Military Police, under the Director General's command and direction, and to charge the Director General with the safe delivery of all freight. It is impossible, as was tried, to place the responsibility for guarding track and movement of freight in cars on the Base Section Commanders.

The railroads, as they must be operated, are an inter-theater operation and cannot under any circumstances be broken down into intra-theater control or direction. Full administration, with particular reference to the personnel and utilization of personnel, should rest wholly and solely with the Military Railway Service. The placing of individual officers and men, as well as the plans of the Director General, must be fulfilled as a part of his sole responsibility, for he alone knows their capabilities and capacities, and where to place a man to get the most from his past experience.

In order that the Military Railway Service may not be unwieldy as to organization, it should utilize the services of other branches of the Army to the fullest extent, such as General Courts-Martial jurisdiction, hospitalization and evacuation, machine records servicing for personnel accounting, all fiscal transactions, and supply of common items. But the Military Railway Service should be charged, as was done in World War II, with the planning for, and the execution of, all strictly railroad matters incident to performing the rail transportation requirements of the Commander in Chief. To share that responsibility with anyone else is to cause confusion and, in some instances, failure, and since the very large percentage of haul should and must be performed by the railroads, they should be permitted to exercise their responsibilities in a manner which will insure complete and thorough success. They cannot be successful, and they cannot fulfill their mission, if they are operated on less than a theater level.

# The Oversea Supply Division At Ports of Embarkation

Major Charles E. Rochford, *Transportation Corps*
Instructor, Command and General Staff College

DURING World War I, with approximately 2,059,000 men overseas, the American ports supplying the oversea theater became so congested with supplies that loaded freight cars were backed up as far inland as Pittsburgh. The ports of embarkation became hopelessly jammed with cargo and were unable to furnish this theater the supplies desired. In World War II, over three times as many Americans overseas were furnished more supplies in a three month period than General Pershing's forces received during the entire war. These supplies were shipped as requested and according to the priorities set by the theater commanders. Yet during the entire war the ports were kept fluid and met emergency situations as they arose in addition to handling the great bulk of routine shipments.

By contrast with World War I, the performance of the ports of embarkation in World War II seems little short of miraculous. Consideration of the fact that during the forty-five months of World War II over 7,290,000 passengers were moved overseas by the Army and then furnished with 127,000,000 measurement tons of supplies and equipment certainly serves to heighten this contrast.

How was the tragic experience of World War I averted? What agencies or organizations were responsible for performing this miracle of oversea supply? Certainly no single agency can be credited with performing this supply feat single-handed. However, a good deal of the credit for the outstanding performance of the several ports of embarkation must be given to the Oversea Supply Divisions of the ports as the staff agencies charged with carrying out the mission of supplying the oversea theaters.

### Oversea Supply Divisions

As a guide to planning for the day when we may again be required to support a large force oversea, let us take a look at the development of this staff division. Prior to the last war the ports of embarkation were simply links in the transportation chain, where a transfer of cargo was effected from land to water transport. The ports had no responsibilities for supply beyond the storing and loading of cargo which the procuring services shipped. Due to the expansion of our oversea bases and the shortage of shipping in 1941, large backlogs of supplies began to accumulate at the ports. In an effort to supply the oversea bases with what they needed, a priority list was published periodically by the G-4, War Department. Using this priority list as a basis, the port commanders attempted to ship, from the rapidly accumulating backlog, the supplies as they were required by the oversea commanders.

This experience, just prior to our entry into the war, made it clear that a different system was needed to insure that the

oversea commanders received what they needed and that the ports were not flooded with supplies which were not needed and could not be shipped. Since the ports formed a channel through which all supplies passed and were of necessity in touch with both the procuring services and the oversea commanders, they were in a strategic position to serve as a regulating agency. This idea was placed in effect in January 1942, and the port commanders were henceforth charged with controlling the flow of supplies into and out of the ports, making automatic shipments of certain supplies, editing requisitions for other supplies in accordance with established allowances, and recommending the level of port reserve stocks and depot credits necessary to carry out this supply operation.

### Designation of Ports

In order to fix the responsibility for the supply of a theater, each theater or base was assigned to a particular port for supply. In this way divided responsibility was avoided and each theater commander could look to a particular port commander as being responsible for the supply of his theater. As our operations overseas grew in size, it was found that a single port, in some cases, could not handle all the cargo for its theater. Rather than divide the responsibility for supplying the theater, a system of outports was established.

The original port was still charged with primary responsibility of supply and was known as the primary port. It assigned tonnages to be shipped from other designated ports which were known as outports of the primary port. These outports acted as agents of the primary port and accomplished the actual shipment for the primary port. This added a great deal of flexibility to the shipping function of the ports and made it possible to utilize the capacities of the various ports as the burden of overseas operations shifted from theater to theater. For example, the New Orleans Port of Embarkation was the port of primary responsibility for the Caribbean and South Atlantic Bases and supplied them throughout the war, but during the period of great activity in the European Theater it also acted as an outport for New York Port of Embarkation which had primary responsibility for that theater. Later on it acted as an outport for the San Francisco Port of Embarkation when the burden of operations shifted to the Pacific Ocean Areas and the Southwest Pacific after VE-day.

### Organization of OSD

Assumption of these new oversea supply functions put the ports in the supply business, and in order to handle all phases of this responsibility the ports organized Oversea Supply Divisions. These divisions were given a staff position comparable to a general staff section—if such can be said to exist in a functional staff organization—and had staff supervision over all matters pertaining to the supply of those oversea theaters or bases for which the port was responsible.

The port technical services, for example, were placed under the Chief of the Oversea Supply Division for the performance of all functions pertaining to oversea supply, while they retained their normal functions as technical services and special staff sections of the port itself. The methods by which this division of functions was achieved varied considerably between ports. Perhaps the most satisfactory solution was the assigning of technical service personnel to the Oversea Supply Division with a complete divorce of the oversea supply functions from the normal technical service functions. In any case, the principle remains the same in that responsibility for all matters of oversea supply was centralized under one staff division.

Since the ports were transportation installations which had been given the additional responsibility for supply, it was necessary in the beginning that both the

port and the oversea command have a common understanding of the mission to be performed. The levels of supply, the troop basis, and general priorities were established by the War Department, while the procedures and supply functions were prescribed by the Army Service Forces. The ports were responsible for translating these policies and supplying the theater in compliance with them to the satisfaction of the theater. In order to insure that the oversea command and the ports would work on a common basis they exchanged liaison officers, and in addition the ports issued a monthly supply policy chart for each theater or base for which it had primary responsibility in order to keep their missions clearly and currently defined. These supply policy charts listed the directives in force, the authorized supply levels, and the troop strength, and in this way called attention to any change in policy which might have resulted in misunderstanding or conflict on supply matters. The use of this supply policy chart was so satisfactory to both the theater and the ports that its use has been continued as a means of insuring a common understanding of the supply policy in effect.

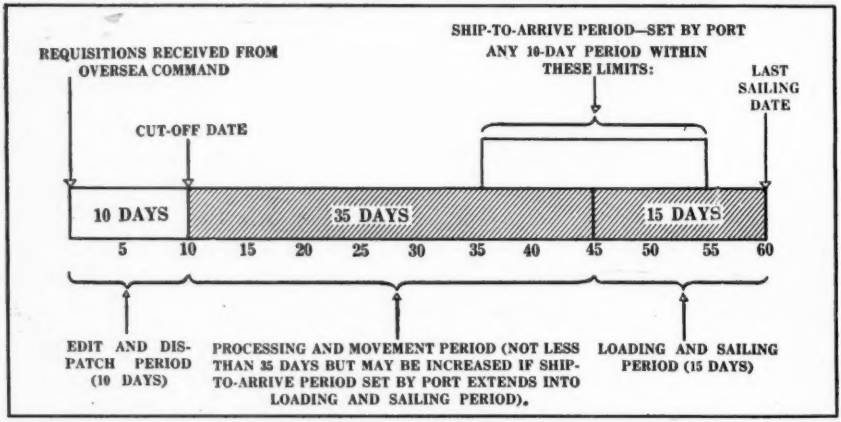
The ports of embarkation, having been made responsible for the supply of the oversea commands, became the agency on which the oversea command placed its requisitions. Therefore, all requisitions from the oversea commands were received by the ports, with the exception of those for a few special items and air force supplies (the ports were only responsible for furnishing shipping space as requested for air force supplies). Under the supervision of the Oversea Supply Division all incoming requisitions were edited and extracted to the source of supply designated to furnish the port with the various types and classes of supplies for oversea shipment. Since all items of supply were not always in stock, there were, of course, many times when depots could not fill

**Army Base at Oakland, California.**

requisitions on time or when items were not available. In these cases, the port was advised by the depot and it in turn advised the theater. As an example, a depot might find that it could not furnish certain items in time for shipment or that certain items were not available nationally for filling the requisition. In such cases, the port was furnished a notice of delayed items or a notice of nonavailability from which it adjusted its records and then advised the theater in order that it might take

Oversea Supply Division prepared convoy or shipping period cycle charts. These charts were based on a planned future sailing date of a convoy or single ship and indicated the time schedule for setting up and shipping supplies to the port, which would enable the port to load the supplies on the ship or convoy for which they were scheduled.

These shipping period cycle charts are now based on the 60-day zone of the interior cycle. (See chart below.) In this way,


REQUISITIONS RECEIVED FROM OVERSEA COMMAND
CUT-OFF DATE
SHIP-TO-ARRIVE PERIOD—SET BY PORT
ANY 10-DAY PERIOD WITHIN THESE LIMITS:
LAST SAILING DATE
10 DAYS
35 DAYS
15 DAYS
5 10 15 20 25 30 35 40 45 50 55 60
EDIT AND DISPATCH PERIOD (10 DAYS)
PROCESSING AND MOVEMENT PERIOD (NOT LESS THAN 35 DAYS BUT MAY BE INCREASED IF SHIP-TO-ARRIVE PERIOD SET BY PORT EXTENDS INTO LOADING AND SAILING PERIOD).
LOADING AND SAILING PERIOD (15 DAYS)

**Sixty-day Zone of Interior Cycle on which is based the time period for each step in supplying the overseas theater. (Extracted from WD Cir 245, 1946.)**

such action as was deemed necessary in view of the shortage of nonavailability of the items. In all cases the ports kept the theater advised of the status of requisitions from the time they were edited by the Oversea Supply Division until shipment was made from the port.

With the dispatch of extract requisitions to depots and other sources of supplies, the action had been taken which would result in a flow of supplies into the port for shipment. If the flooding of the ports with supplies was to be avoided, a means of controlling this flow had to be devised. As a basis for this control, the

the time allowed for the completion of each phase of supply is established, and the depot is furnished on each extract requisition the ship-to-arrive period in the form of dates between which the supplies must arrive at the port to permit loading to sail as desired. In addition to providing a basis on which to control the flow of supplies into the port, the shipping period cycle provides a basis for checking each activity in the supply cycle to insure that each agency is performing its prescribed function properly. Since the cycle establishes definite periods during which each function of setting up and

shipping of supplies must be completed, the Oversea Supply Division uses these same dates to record the status of every requisition placed on each source of supply until the requisition is completed or items which cannot be furnished are cancelled. This type of control enables the port to maintain vigorous follow-up on all requisitions to insure that the agencies of the port perform their functions, and in addition, that the depots and supply services are advised of any failure on their part in supplying the oversea command.

### Shipment Planning

Concurrent with the processing of requisitions and the shipment of supplies to the port, the port makes necessary plans for the water shipment of the cargo to its destination. This planning begins with the arrival of the requisition from the theater. Based on the estimated weight and cubage of supplies on each requisition, a forecast of cargo for each future shipping period by destination is worked up and provides the port with a chart on which it can base its needs for shipping space, labor, and facilities to handle the shipments. This chart is kept current to show all additions, cancellations, deferments, and revisions that effect the tonnage forecast, and, as the shipping period approaches, will show the cargo added by backlog from the previous shipping period, the tonnages en route from the depots and the tonnages expected to arrive during the ship-to-arrive period for loading. This chart is continued through its shipping period until all the forecast supplies have been accounted for either by being loaded and shipped or backlogged to a later shipping period.

Shipping to carry the cargo to the oversea destination must, of course, be provided for in advance of the arrival of the cargo in the port. Based on his knowledge of the current status of supply shipments and the forecast of tonnages for future periods, the Chief of the Oversea Supply Division keeps the Chief of Transportation advised as to the amount of shipping required, the time or period during which it will be required, and the location at which it will be required—such as an outport from which a primary port is making shipments—in order that shipping to handle this cargo may be procured and allocated on time. Of course, the shipment of troops and troop units with their equipment also requires shipping space, and there must be close liaison and coordination between the Oversea Supply Division and the Troop Movement Division in order to coordinate their respective shipping needs.

With the cargo planned and the shipping necessary to lift that cargo allocated to the port, one would think the planning pretty well in hand. This would be true if a port only loaded a single ship at a single pier during each shipping period. However, the ports loaded from fifteen to fifty ships at a time at terminals miles apart, served by entirely different rail lines and often on opposite sides of the harbor.

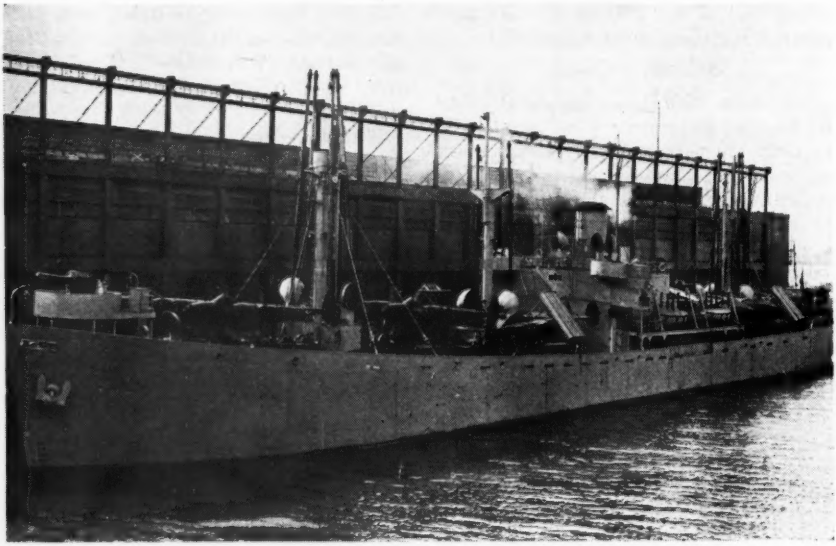
### Master Loading Plan

In order to synchronize the arrival of cargo with the availability of ships and berths at which to load them, the ports worked out a Master Loading Plan for each shipping period. This plan outlined the general scheme of loading the cargo during each shipping period and provided a basis upon which the Port Transportation Division could call in shipments to the proper terminals and arrange for the receipt of the shipments. The Water Division of the port based its plans for berthing of the vessels, voyage repairs, refueling, storing the ships, stowage, stevedoring service, and the necessary special equipment required on this Master Loading Plan. The Oversea Supply Division's part in preparing this plan was considerable in that it was this agency which had complete knowledge of the supplies to be

shipped, the priorities, and the desires of the theater concerned.

Being charged with the staff supervision of all phases of oversea supply, the Oversea Supply Division continued its follow-up on the supplies until they were finally loaded on the ships, and the supply cycle started by the receipt of a requisition from the theater was thereby completed. Early in the war the responsibility of the Oversea Supply Division did not stop even then. For a time it was responsible for replacing immediately all cargo lost en route to the theater. This, of course, meant that the Oversea Supply Division had to initiate the requisitions and follow through to complete the reshipment of all items listed on the manifest of a ship lost at sea. Later, this responsibility was transferred to Army Service Forces.

From this discussion it should be evident that the Oversea Supply Division of the ports of embarkation contributed materially in solving a very serious problem which threatened to disrupt the supply of oversea commands. This solution was one of regulation and control exercised by: (1) Constant liaison and interchange of information to keep in close touch with both the procuring service and the theater to insure a common basis of operation; (2) Editing and extracting the theater's requisitions to known sources of supply which insured that the theater would be supplied with the available authorized supplies; (3) Controlling the flow of supplies into the port by establishing time schedules to fit the shipment of supplies to the shipping schedules; (4) Constant planning to forecast the outline of the job to be done, and more immediate planning of how the job was to be done until the supplies were finally on their way to the theater. In addition to these activities, the Oversea Supply Divi-



**A "Liberty" ship loaded and ready to sail.—Marine Corps photo.**

sion, in its role as the staff agency responsible for supply of the theaters, could and did initiate vigorous follow-up on all oversea supply matters to insure that all agencies performed their allotted missions.

Based on the performance during World War II, it is reasonable to assume that we now have an organization or agency which is capable of supplying large forces overseas using water transport. In all of our thinking of the future, the use of air transport looms up as a much more important method of transport than was true in the past. How can we adjust our organization to fit a transportation system which will move large tonnages by air? Tied very closely to that question is one of organization. The inclusion of the Oversea Supply Division as an integral part of the port of embarkation has made each port a link in the requisition chain from overseas in addition to its primary function as a shipping agency. Should these two functions be separated?

One possible solution is the separation of the Oversea Supply Division from the ports of embarkation and their establishment as separate field agencies. This concept visualizes an oversea supply agency which would be charged with the supply of a theater, but which would itself not be part of the transportation system except as a regulating or control agency. The shipping requirements of this agency would be met by allocation of tonnages to be handled through the various water and aerial ports as its needs developed in much the same manner as outports were used during the last war. We must look for some solution which will permit greater dispersion of the agencies in the supply chain if we are to overcome the tremendous destructive powers of the weapons of the future.

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**In July 1940 there were two Army ports of embarkation at New York and San Francisco. At the end of the war there were eight ports of embarkation, three subports and three cargo ports. During this period the personnel of the port organization increased from approximately 3,000 to 180,000. Of the latter figure, 10,000 were officers, 63,000 were enlisted men, 77,400 were civilian employees, 18,000 were civilians engaged under stevedoring and other contracts, and 11,000 were captured Italians and Germans.**

*Report of the Chief of Transportation*

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**Unification gives effect to the obvious fact that we cannot fight three separate wars—or two separate wars—against an enemy, that air, sea and land must work together—and must prepare together—as a fully coordinated and efficient team under a single leader.**

*Secretary of the Army Kenneth C. Royall*

# The Combined Infantry-Armored Division

Colonel E. T. Conley, *Infantry*
Instructor, Command and General Staff College

OPERATIONS in World War II showed a constant desire by infantry division commanders for more armor, and by armored division commanders for more infantry. Actually each type of division was frequently reinforced with a major combat element of the other. Further, infantry divisions were frequently called upon to execute armored division missions and armored divisions were required to operate in the infantry role. Since the close of the war, reorganization in both types of divisions have reflected these wartime trends. The number of tanks organic to the new infantry division has been greatly increased while the infantry in the new armored division has been greatly strengthened.

In view of these facts, the proposal is frequently made to develop one combined type ground division, sufficiently strong in both infantry and armor to make it capable of performing the primary role of both the present type infantry and armored divisions.

The primary role of the infantry and of the armored divisions is based on current army field manuals. "The Infantry is essentially an arm of close combat. Its primary mission in the attack is to close with the enemy and destroy or capture him; in the defense to hold its position and repel the hostile attack" (FM 100-5). "The Armored Division is capable of engaging in most forms of combat, but its primary role is in offensive operations against hostile rear areas.—In general the role of the infantry divisions operating with armored divisions is to make the opportunity, and the role of the armored division is to exploit it" (FM 17-100).

This discussion is limited to the following points:

1. Assumptions made for purposes of discussion.
2. Training of the combined division.
3. Logistics involved in the combined division.
4. Operation of the combined division.
5. The principle of pooling units as it applies to the combined division.

### Assumptions Made for Purposes of Discussion

There are numerous conceptions of the make-up of the combined division, particularly with respect to its strength, mobility and efficiency as compared with the present infantry and armored divisions which it would replace. Therefore, for the purpose of this discussion, certain assumptions have been made concerning fundamental characteristics. It is assumed that the combined division must retain the nine battalion infantry strength of the present infantry division and the four battalion tank strength of the present armored division. It is assumed that the combined division must retain the mobility of the present armored division. It follows as a corollary to these two assumptions that the combined division must be consider-

ably larger than either the present infantry or armored division; and further, with our national manpower as a controlling factor, it follows that fewer of these large combined type divisions could be formed than of the smaller separate type divisions. Finally, it is assumed that no sacrifice of the best qualities which the best infantry and armored divisions displayed during World War II would be acceptable in the combined division.

**Training of the Combined Division**

The problem of training only one type of division would, at first sight, seem much simpler than training two types. A single training pattern could be adopted and the entire training effort could be concentrated on molding all divisions to this single pattern. However, we encounter trouble when we contemplate the application of this idea.

While it is true that there is now a considerable overlap in the training requirements of the two types of divisions, it is also true that there are some radically different training requirements, principally in the field of tactics and technique. Generally the tactics and technique of one type of division are based on the proper maneuver and employment in battle of men on foot supported by all other means available, while the tactics and technique of the other are based on the proper maneuver and employment in battle of men in armored vehicles supported by all other means available. Perfection in both types of operation by the same commanders on all levels, and by the same troops would necessarily be the objective. Past experience indicates that this perfection would be most difficult to accomplish. Under the pressure of rapid mobilization and subsequent heavy replacement demands due to combat, it seems highly improbable that it could be attained.

**Logistics Involved in the Combined Division**

From the logistical point of view, little can be said in favor of the proposed combination. We have assumed that the plan would result in a reduction in the total number of divisions which could be organized. However, due to the requirements that we must establish for the combined division, the result would be an increase rather than a decrease in the over-all amount of equipment needed.

The exact number of combined divisions that we could organize is immaterial for the purpose of this discussion. With complete mobilization, however, the total would certainly be closer to the sixty-six infantry divisions than to the sixteen armored divisions which were organized during World War II. With this in mind, the increase in the over-all amount of equipment required becomes more apparent when we consider that each combined division will have at least as many tanks as each armored division has now. In addition, each combined division will require the transportation necessary to transport its nine infantry battalions, disregarding other transportation needs. All, or at least the bulk, of this transportation must be of the armored personnel carrier type in order that the infantry can give the tanks the same type of support which armored infantry now gives them.

The only alternative to making this equipment organic to each division is to make it available in pools controlled by a higher headquarters such as Army. From an operational point of view, this is not considered a satisfactory solution. The reason for this conclusion is explained later in the discussion.

The over-all increase in combat vehicles would place a tremendous strain on both industry, which would have to fill initial and replacement requirements, and the field services, which would have to provide the fuel, spare parts and maintenance at theater, army and division level.

But logistics also involve movement,

and the ability to move is limited by available roads and road nets. The road nets of western Europe were able to support the thousands of vehicles which carried the mobile allied armies in the last war. At times, however, they did so with great difficulty. Always the availability and condition of roads were an important, and often the controlling considerations. With a great increase in the number of organic vehicles in combined divisions, the location of areas with road nets capable of supporting large scale operations by them will become most difficult. If we do not have the opportunity to choose the area, the available road net in the area in which we are forced to operate may seriously affect the successful employment of such divisions.

**Operation of the Combined Division**

From the operational point of view, the proposed combination has much merit. Flexibility in the employment of divisions by corps and army would be greatly increased. A corps commander on the defense would no longer have to decide whether to employ an armored division in the line to relieve a combat weary infantry division, or to let the infantry division remain there a while longer in order to permit retaining the armored division for a prospective offensive. A more equitable distribution of the combat load on the divisions in a corps and army would be possible.

Of equal importance, the tell-tale massing of armored divisions in the area of a corps or army which is so difficult to conceal, and which is such a sure indication to the enemy of what is coming, would no longer be necessary.

On the other hand, however, the larger combined division would present certain very undesirable operational characteristics.

While performing an infantry role, which experience indicates would be the case usually, a large part of the combined division would be idle. This would present to the division commander problems of equitable distribution of the combat load within the division, and of tactical disposition of a large mass of vehicles in the division area. It would present to higher commanders the problem of supporting and maintaining within the combat zone large numbers of men and large amounts of equipment which too often would take no part in combat. It would present to commanders of all levels the problem of overcoming the inertia which this idleness creates.

**The Principles of Pooling Units as Applied to the Combined Division**

One of the most common conceptions on which the combined division is based depends on the principle of pooling. According to this principle, certain types of units are maintained in pools under a higher headquarters which assigns them to divisions as the situation demands. Pooling in principle is sound and was so proved in World War II. However, its application has very definite limits because of its effects on different types of units. As applied to the combined division it would mainly involve pooling of any or all of the following units: tank battalions, infantry battalions and transportation units, such as armored personnel companies required to carry the infantry battalions.

The pooling principle is acceptable only when applied to those units whose efficiency is not dependent upon close and intimate teamwork between the individual soldiers from the pool and the individual soldiers of the unit to which an attachment is made from the pool. Such teamwork is not necessary between the truck drivers of a truck company and the soldiers of an infantry battalion they transport. Such teamwork is not necessary between the individual soldiers of the heavier artillery battalions and the infantry soldiers they temporarily support; they rarely ever see each other. These

units readily lend themselves to the pooling principle. On the other hand, the very essence of a successful tank-infantry operation (regardless of which is the supported arm) is the application of highly developed teamwork on all levels down to and including the tank crew, the infantry squad and the drivers of the armored personnel carriers. Their teamwork can be obtained only as a result of personal acquaintance and mutual confidence developed throughout the entire training period and later during combat. It cannot exist between infantry and tank units who, though similarly and equally well trained in their respective roles, are temporarily assembled from pools, and personally meet each other a few hours before the battle, or perhaps never at all.

### Conclusion

In conclusion, an analysis of the points covered in this discussion favors the retention of the present two types of divisions. Experience in World War II has been admittedly an important factor in forming this conclusion, and therefore it is perhaps open to the criticism that it represents good hindsight, but may be lacking in foresight. But the manner in which the armored and infantry roles will be accomplished in any future war will depend to a great extent upon the types of weapons available in that war. The ability of the infantry soldier, as well as the tank itself, to survive on the battlefield of the future is being questioned currently. However, we must fight any war which may come within the next three or four years with substantially the same weapons we used during World War II. Hence, lessons learned in that war in the use of these weapons are rightly given great weight at this time.

On the other hand, we must reserve the right to change our minds. We must be continuously looking for sound reasons for change in accordance with the requirements made by new developments. A year from now—probably more but possibly less—such developments may well make the proposed combination mandatory, or on the contrary, they may make the creation of even a new type of division necessary. When these developments have been made, tested and accepted, the change necessary to accommodate them must be made promptly. For the present, the conclusion arrived at concerning this proposal appears to be sound.

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**The Army phases of a balanced air-sea-ground organization require special stress at a time when many voice the opinion that land forces have been made obsolete by the advance of aviation, the development of rockets and the atomic bomb. Today the only element of the military establishment that can hold a defensive position, seize for exploitation a major offensive base, exercise direct complete control over an enemy population—three fundamental purposes of armed effort—is, as always, the foot-soldier. The introduction of the plane and the atomic bomb has no more eliminated the need for him than did the first use of cavalry or the discovery of gunpowder.**

*General of the Army Dwight D. Eisenhower*

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**Great as is the power of air and other scientific means, the best assurance of their being able to bring to bear the great power they wield is the ground forces.**

*Lieutenant General Raymond S. McLain*

# Personnel Problems in an Army Concentration

Lieutenant Colonel John A. Gavin, *Infantry*
Instructor, Command and General Staff College

THE purpose of this article is to present a discussion of the initial pertinent activities and plans of an army G-1 section in an army concentration. In this case, the army concerned is faced with the problem of moving its headquarters and assigned troops to a new sector and preparing to resume the offensive on this new front. Attention will be called to the nature of the information which the army G-1 must seek in such a situation in order to assist him in arriving at a sound, practical personnel plan to support the army concentration and offensive. Also, it will be the author's purpose to show how this army G-1 arrives at certain conclusions in his personnel planning based on some of the assumed results of his search for this needed information.

### Situation

On 1 August 19—, Red and Blue situations were as shown on Situation Map A.

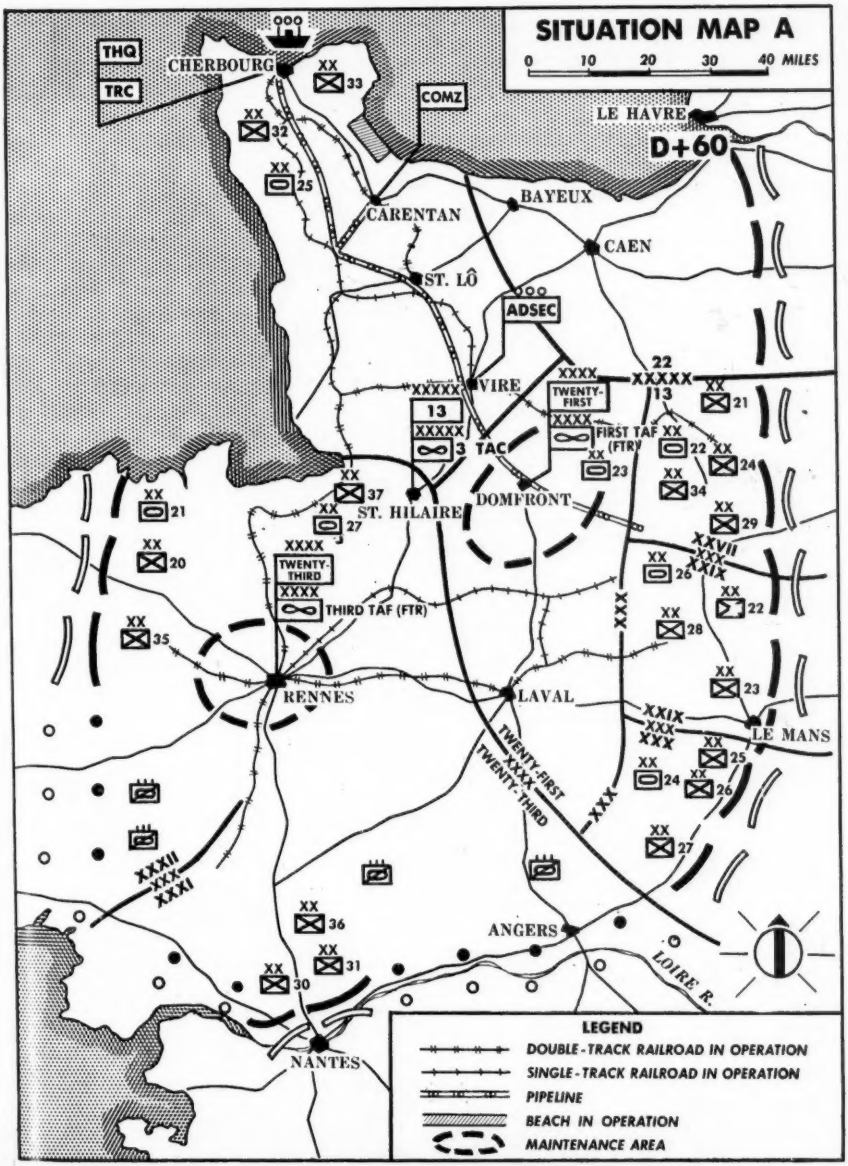
The Commanding General, Twenty-third Army, knows that upon completion of his current operations on the Brittany Peninsula his Army is to be used, in conjunction with the Twenty-first Army, in a general offensive to the east.

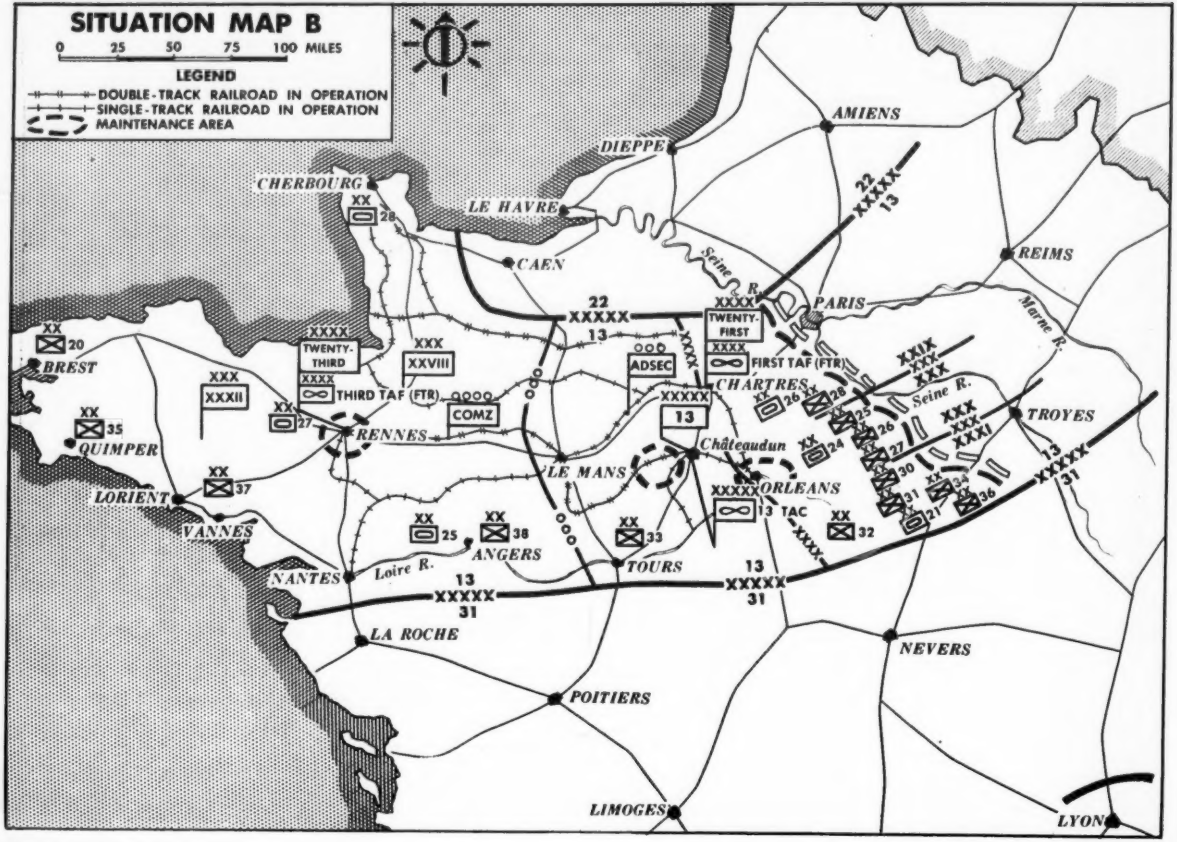
During the period 1-10 August 19—, the tactical situation changed appreciably. The Twenty-third Army had practically cleared the Brittany Peninsula of the enemy except for the stubborn pockets of resistance in the vicinity of Brest, Quimper and Vannes. The XXXI Corps had been moved during the same period to the eastern front, assigned to Twenty-first Army, where it extended the Twenty-first Army front to the south.

On 10 August 19—, the commanding general, Twenty-third Army was verbally warned that upon completion of his operations on the Brittany Peninsula his army would take over the right portion of the line then held by Twenty-first Army. He was advised that Twenty-third Army would have the XXX, XXXI and XXXII Corps for a continuation of the offensive to the east, but that he would also be expected to concentrate the XXVIII Corps (four infantry and two armored divisions) in the vicinity of Orleans (Situation Map B). The XXVIII Corps was to be initially in Thirteenth Army Group reserve and used by either Twenty-first or Twenty-third Army in the general offensive to the east. Twenty-first Army was to establish the prescribed level of reserve supply for the XXVIII Corps.

The Commanding General, Twenty-third Army, visited Thirteenth Army Group Headquarters at St. Hilaire, on 11 August, where he was informed that:

(1) Twenty-first Army was expected to reach the Seine and Yonne Rivers, on or about 25 August (Situation Map B) and operations by Twenty-third Army will be intensified with a view to clearing the Brittany Peninsula by that date. The probable location of divisions on the Brit-


SITUATION MAP A
0 10 20 30 40 MILES
THQ
TRC
CHERBOURG
XX 33
XX 32
XX 25
COMZ
LE HAVRE
D+60
BAYEUX
CARENTAN
CAEN
ST. LÔ
ADSEC
VIRE
XXXX
XXXXX
TWENTY-FIRST
13
XXXXX
3 TAC
FIRST TAF (FTR)
22
XXXXX
13
XX 21
XX 22
XX 24
XX 23
XX 34
XX 37
XX 27
ST. HILAIRE
DOMFRONT
XX 21
XX 20
XX 29
XXVII
XXIX
XX 26
XXXX
TWENTY-THIRD
XXXX
THIRD TAF (FTR)
XX 22
XX 28
XX 35
XXX
RENNES
LAVAL
XX 23
XXIX
XXX
XXX
LE MANS
XX 25
XX 24
XX 26
XX 27
TWENTY-FIRST
TWENTY-THIRD
XXXX
XXX
XXXII
XXX
XXXI
XX 36
XX 31
XX 30
ANGERS
LOIRE R.
NANTES
LEGEND
DOUBLE-TRACK RAILROAD IN OPERATION
SINGLE-TRACK RAILROAD IN OPERATION
PIPELINE
BEACH IN OPERATION
MAINTENANCE AREA


SITUATION MAP B
0 25 50 75 100 MILES
LEGEND
DOUBLE-TRACK RAILROAD IN OPERATION
SINGLE-TRACK RAILROAD IN OPERATION
MAINTENANCE AREA
AMIENS
DIEPPE
CHERBOURG
LE HAVRE
CAEN
Seine R.
REIMS
PARIS
Marne R.
BREST
TWENTY-THIRD
XXVIII
ADSEC
TWENTY-FIRST
FIRST TAF (FTR)
THIRD TAF (FTR)
COMZ
CHARTRES
Seine R.
TROYES
QUIMPER
RENNES
Châteaudun
LE MANS
ORLEANS
13 TAC
LORIENT
VANNES
ANGERS
TOURS
NANTES
Loire R.
LA ROCHE
NEVERS
POITIERS
LIMOGES
LYON

tany Peninsula on 25 August is indicated on Situation Map B.

(2) Red Forces were withdrawing from the south flank of the Thirteenth Army Group to oppose the Blue Thirty-first Army Group, which had advanced rapidly from Southern France, reached Lyon, and was expected to be on the general line: Dijon—Chatilion Sur Seine by 20 September.

The Commanding General, Twenty-third Army, on return to his command post at Rennes, outlined the following plan that had been discussed at Army Group Headquarters, which he desired the Twenty-third Army staff to consider in detail:

(1) By 1 September, assume command, in place, of the XXX and XXXI Corps, (including attached troops) and Twenty-first Army service troops in the area.

(2) Between 1-10 September, concentrate XXVIII Corps and XXXII Corps (two infantry and one armored divisions), with attached and supporting troops, in the vicinity of Orleans.

(3) By 15 September, be prepared to continue the offensive to the east.

### Over-all Personnel Problems

From the warning order issued by Headquarters, Thirteenth Army Group, on 10 August, G-1, Twenty-third Army, knows that the Army has been given the task of: (1) moving two corps and army troops (approximately 250,000 men) a distance of over 200 miles; (2) taking over, in place, two additional corps and supporting troops now in contact with the enemy; and (3) making preparations for the resumption of the offensive on a new front in about one month's time. G-1 also knows that some of the troops to be moved are still fighting on the Brittany Peninsula and will probably continue to fight until just prior to their movement to the concentration area. By a careful analysis of these facts, G-1 knows that his main problems resolve themselves logically into two categories by virtue of location. There will be problems to be encountered in the Brittany area as well as problems to be met in the concentration area. Some of them will be common to both localities. Others will be new and different. However, the objective of G-1, Twenty-third Army, in all his planning will be to provide the maximum administrative support to the Army for its newly assigned offensive mission to the east.

The major problems confronting G-1 in the Brittany area are:

To ascertain the latest strengths of all units in the area under army control.

To continue to furnish replacements to all units of the Army right up to their time of movement, if possible.

To make arrangements for disposal of general prisoners on hand.

To make arrangements for disposal of prisoners of war on hand.

To close out or turn over to the communications zone the army cemetery in this area.

To turn over to communications zone all military government units now under army control in this area.

To effect the required coordination with reference to the closing out of present facilities being utilized for billeting and office space for the Army Headquarters.

To arrange for disposition of native civilian employees in this area whose services are no longer required.

As concerns the concentration area, G-1, Twenty-third Army, has many major points to check on. He must:

Ascertain the complete personnel picture as concerns all units in the zone to be occupied.

Arrange for the uninterrupted flow of replacements to XXX and XXXI Corps after 1 September; also, divert the flow of replacements from the Brittany Peninsula to the Orleans area in time for them to be available for assignment to units in accordance with phasing of troops into the concentration area.

Make plans for evacuation of prisoners of war after 1 September.

Arrange to take over installations of G-1 interest; also establish new personnel installations as may be required.

Determine the status of military government units in the new zone. Coordinate with G-5 on arranging for freezing of civilians, particularly on the south flank and on the line of contact, for reasons of security.

Coordinate with other staff members on rehiring of native civilians in Zone.

Endeavor to have units (such as special service companies, replacement battalions and machine record units) performing personnel operations missions now supporting XXX and XXXI Corps, assigned to Twenty-third Army.

The above constitute the major problems of the G-1 Section, Twenty-third Army, in this particular situation. The nature of these varied problems indicates the large amount of information G-1 must obtain from various staff agencies and commands other than Twenty-third Army before he can formulate his personnel plan. Once his initial plan is determined, it must be kept up to date as additional facts are obtained. As decisions are made, prompt dissemination of the approved details by G-1 to subordinate units is a prerequisite to the success of the plan.

**Activities of the G-1 Section, Headquarters Twenty-Third Army, 10-18 August**

In order to resolve these many varied personnel problems, the Army G-1 had to assign many tasks to his immediate assistants and certain special staff members. In order that the reader may gain an appreciation of the magnitude of the personnel staff work and planning involved in a situation of this nature, let us *look in* on the activities of the G-1 Section, Headquarters Twenty-third Army, and see what may well have taken place during the critical period of 10-18 August 19—.

G-1 received the details of the warning order at an army staff conference on 10 August. At that conference, G-1 asked G-3 for his estimate as to when the fighting would terminate on the Brittany Peninsula. G-3 estimated that this would occur on or about 25 August. G-1 also wanted to know, as soon as possible, the general plan for the movement of units to the concentration area. In this connection, he asked G-3 to keep him advised on details of the plan as it evolved. Inasmuch as G-1 knows that certain infantry divisions assigned to XXVIII Corps are appreciably understrength, due to battle casualties, he requested G-3 to have these particular units assembled in unit areas at the earliest possible date for rehabilitation. The chief of staff asked all chiefs of general staff sections at this same meeting to provide him, by 1200, 11 August, with a list of other headquarters and agencies they desired to contact on details concerning the concentration.

Upon his return to his office from this initial meeting, G-1 called in his branch chiefs and the chiefs of those special staff sections affiliated with G-1. The Commanding General, 11th Replacement Depot, which is attached to Twenty-third Army, was also available and attended G-1's staff conference. At this meeting, the Army G-1 acquainted this personnel with the details of the warning order and such other information that he had obtained at the chief of staff's conference. G-1 directed that they return to their own sections, analyze the tasks involved and submit to him, by 1000, 11 August, a list of these agencies and headquarters that they might wish to contact, together with the information to be requested. He asked the Commanding General, 11th Replacement Depot, to secure for him the latest information on the status of replacements.

If the Chief of Staff, Twenty-third Army, had not arranged for a meeting with the commanders and staffs of XXVIII

and XXXII Corps, G-1 would have had a message dispatched in the name of the commanding general directing that the G-1s of these two Corps report to Army Headquarters by 1700, 11 August, with latest available daily summaries and other reports which would enable the Army G-1 to estimate the personnel situation of the Corps involved.

By 1100, 11 August, G-1 received and consolidated the list of agencies and headquarters to be contacted and the information to be requested. This list included Headquarters, Thirteenth Army Group; Twenty-first Army; XXX and XXXI Corps, Communications Zone and Advance Section. The chief of staff later that same day secured authority from Headquarters, Thirteenth Army Group, for all staff sections to contact their opposite numbers in these various other headquarters in arranging details incident to the concentration. Due to the wide distances involved, it was deemed essential that economy in the use of liaison airplanes be enforced to accomplish these staff visits.

Accordingly, G-1 authorized members of the special staff to contact their opposite numbers on the other staffs mentioned previously concerning purely technical matters. Arrangements were made for staff visits by G-1 or his representatives as follows:

| *To visit* | *Period of stay* |
|---|---|
| Headquarters, Thirteenth Army Group | All day—13 August. |
| Headquarters, Twenty-first Army | 13-18 August (one officer to remain). |
| Headquarters, XXX and XXXI Corps | 14-18 August. |

At 1700, 11 August, G-1 Twenty-third Army, received a visit from the G-1s, XXVIII and XXXII Corps. After orienting these staff officers on the new army mission, the Army G-1 requested the latest available personnel reports on the assigned strengths of these two Corps. G-1, XXVIII Corps, reported a total shortage of 8,800 men in the four infantry divisions assigned to that corps (average 2,200 per division). G-1, XXXII Corps, reported a total shortage of approximately 2,800 men in the two infantry divisions assigned (average 1,400 per division).

During the morning of 12 August, the Commanding General, 11th Replacement Depot, visited the Army G-1. He reported that, as of midnight 11-12 August, there were some 2,000 replacements present in the replacement depot that had not been assigned to units. He also informed G-1 that an additional average flow of 400 replacements per day could be maintained until 25 August when, according to the theater replacement command, tentative plans called for the flow to cease into the Brittany area. Based on these figures and a proposed plan of allocation, the G-1 section estimated that upon assignment of this replacement personnel to the infantry divisions on the Brittany Peninsula, the infantry divisions of the XXVIII Corps will average 88 per cent of authorized strength, and that the divisions assigned XXXII Corps will be brought up to 95 per cent of authorized strength. G-3 and the chief of staff approved this recommended allocation for planning purposes. Hence, one item in the G-1 plan is made firm. G-1 must now act on this decision and inform all interested parties.

On 13 August, representatives of the G-1 section departed on their planned staff visits, after informing the various headquarters of the purpose, composition and expected time of arrival of the groups designated.

G-1, Twenty-third Army, accompanied by the adjutant general, elected to visit Headquarters, Thirteenth Army Group. G-1 carried with him a list of questions submitted by certain special staff sections. Specifically, he had in mind the following problems to discuss with the Army Group G-1:

To inquire as to the number of replacements to be allocated to Twenty-third Army in the concentration area (period

1-15 September). Reports on losses and replacements to be furnished in Brittany were carried by G-1 to this conference, as well as the loss rates experienced by XXX and XXXI Corps.

To request Thirteenth Army Group to ask communications zone authorities to send liaison officers to Headquarters Twenty-third Army at Rennes to work out details concerning the turnover of cemeteries, prisoners of war, general prisoners and military government units.

To receive answers to the list of questions submitted by special staff sections referred to above.

While G-1 was discussing these matters, the Army adjutant general visited his opposite number in Headquarters, Thirteenth Army Group. He received information concerning postal matters, casualty reporting, awards and decorations and other administrative matters related to the concentration area. On his return trip, the Army adjutant general visited the base postal officer and the commanding officer of the supporting regulating station. By so doing, he was able to initiate arrangements whereby delivery of mail to units would be uninterrupted during the move to the concentration area.

At the meeting with G-1, Thirteenth Army Group, G-1, Twenty-third Army received only partial answers to his inquiries. G-1 was informed that headquarters, Communications Zone, was sending a liaison group to Headquarters, Twenty-third Army in Rennes on 15 August to arrange for the take-over of Army installations in the Brittany area. In this connection, Army Group directed that problems not solved to the mutual satisfaction of both parties would be referred to Headquarters, Thirteenth Army Group for decision. With reference to replacements, Army Group G-1 confirmed the number allocated to Twenty-third Army up until 25 August (Brittany) and stated that Army would be further advised on the number to be allocated in the concentration area.

On 14 August, a conference was held at the Army command post. The Army G-1 replacement representative presided. Also present were representatives of G-1 XXVIII Corps, and XXXII Corps, and a representative of the Commanding General, 11th Replacement Depot. The following items were agreed upon at this meeting:

(1) That the 11th Replacement Depot would accompany Twenty-third Army in its move to the concentration area; further, that this unit would move at such a time as to be set up and ready to dispatch replacements to units not later than 1 September.

(2) That a battalion from the 11th Replacement Depot would remain in the Brittany area to process replacements arriving in the latter part of August. Also, the infantry divisions of XXVIII and XXXII Corps would absorb these replacements prior to movement to the concentration area. G-1 announced that a detailed schedule would be published shortly.

(3) That the Commanding General, 11th Replacement Depot, would make tentative plans to take over the 1012th and 1016th Replacement Battalions, presently supporting XXX and XXXI Corps, respectively.

The personnel plan of the Army G-1 continued to develop as these decisions were reached. These decisions must necessarily be implemented by means of orders to all interested units and agencies. In this case, for example, G-4 must be asked to include provision in the movement plan for the replacement depot, consisting of the depot headquarters and four battalions.

During the afternoon of 14 August, the G-1 section formulated plans concerning the movement of the Forward Detachment, Headquarters, Twenty-third Army,

to Orleans on 20 August. Prior to this time, a memorandum had been sent by G-1 to all staff (general and special) sections of the headquarters requesting recommendations as to the representation they desired to send with this detachment. These recommendations were consolidated by G-1, on 14 August, and sent to the chief of staff for approval. This does not concern the movement of the Army command post proper, but comprises the movement of the advance party of the headquarters. Each staff section recommended at least one officer and one clerk be sent. The total party, including essential housekeeping detachment, numbered thirty officers; three warrant officers; and sixty-five enlisted men. The chief of staff approved the composition of this party. G-4 stated that motor transportation would be made available. All interested staff sections were notified. G-1 instructed the headquarters commandant to make necessary arrangements for this movement. The Commanding General, Twenty-first Army was requested by G-1 to have the military government officers at Orleans make billeting space available for this detachment, and to have him assemble data on the availability of buildings for use in establishing Headquarters, Twenty-third Army, within the city limits of Orleans.

The liaison officers from Headquarters, Communication Zone, arrived at Rennes on 15 August. After consultation with various branch chiefs of the G-1 Section, Twenty-third Army, and following a series of telephone conversations with their own headquarters, the following agreement was reached:

(1) That communication zone would either evacuate or take over in place, all general prisoners on 7 September.

(2) That communication zone would either evacuate or take over in place all prisoners of war on 7 September.

(3) That communication zone would take over the Army cemetery in Brittany on 10 September.

(4) That the military government units would be taken over by communication zone as areas were vacated by troops of the Army.

The chief of staff approved these arrangements. A copy of this agreement was sent to Headquarters, Thirteenth Army Group. All army installations were notified and directed to comply with the provisions of this agreement.

At 1200, 16 August a teletype message was received at the Army command post from Headquarters, Thirteenth Army Group. The text of this message stated that 17,000 replacements were allocated to the Twenty-third Army in the Orleans area for the period 1-15 September. Earlier that same morning, G-1 had received a message from his representative at the Twenty-first Army command post which stated that arrangements had been made whereby the 10th Replacement Depot, supporting Twenty-first Army, would continue to service units of XXX and XXXI Corps until midnight 31 August, and that present estimates indicated all units of those Corps would be at Tables of Organization strength at time of take-over. With this information, the G-1 section initiated a study as to the adequacy of replacements to support the advance of Twenty-third Army to the east. In so doing, it had to take into consideration the following factors:

(1) Strength of the XXVIII and XXXII Corps at time of movement.

(2) Need to build up the strengths of XXVIII and XXXII Corps during period of concentration.

(3) Need to furnish replacements to XXX and XXXI Corps for period 1-15 September in order to maintain their combat effectiveness.

(4) Need to establish a reserve of replacements to support the attack.

The alternate plans reached in this study were as follows:

Plan No. 1.

On 15 September:

To have XXX, XXXI and XXXII Corps at Tables of Organization strength.

To utilize balance of available replacements to build up strength of units in XXVIII Corps.

To have no reserve of replacements on hand to support the attack.

or

Plan No. 2.

On 15 September:

To have XXX, XXXI, and XXXII Corps at Tables of Organization Strength.

Not to give replacements to XXVIII Corps in the concentration area.

To have a reserve of replacements on hand in the 11th Replacement Depot and the replacement battalions to support the attack of 15 September.

This study was forwarded to the chief of staff through G-3, with the recommendation that Plan No. 1 be adopted if it was definitely assured that XXVIII Corps was to be employed by Twenty-third Army; otherwise, it was recommended that Plan No. 2 be approved with the added stipulation that Communication Zone or Twenty-first Army be charged with furnishing replacements to the XXVIII Corps.

### Other G-1 Activities

Prior to the return of the G-1 representatives who had been sent to Headquarters, Twenty-first Army, G-1 considered some other important matters. He asked the Commanding General, 11th Replacement Depot to exert every effort through replacement channels to expedite the return of the maximum number of personnel released from hospitals in Brittany and United Kingdom areas. After coordination with G-3 and the chief of staff, he secured tentative approval to arrange for the movement of the forward echelon of the army headquarters, so as to arrive in Orleans on or about 1 September, and for the rear echelon to close in that same area on or about 13 September. Of course, this movement had to be closely coordinated with G-4 for transportation. A realization of the fact that while the organic army troops number only some 3,000 officers and enlisted men, this number consists of small disconnected groups, such as Headquarters and Headquarters Company and Special Troops, Military Police Battalion, three Signal Battalions, etc. In addition, other groups such as press representatives, intelligence teams, liaison officers, and technical experts would usually be found in and around an army command post. This is indicative of the many details and plans G-1 must closely supervise to insure the orderly movement of the headquarters as well as providing office space, billets, and messing facilities.

At 1500, 18 August, the G-1 staff officers returned to the Army command post from their visits to other headquarters. The officers who visited the XXX and XXXI Corps informed G-1 that they had in their possession the present strength and locations of all units in those areas, together with notes on all matters of personnel interest. There were no important deficiencies noted. These representatives stated that they had delivered copies of the Twenty-third Army standing operating procedures and current memoranda to the Corps G-1s for their information and guidance. Both of the corps G-1s had informed the army representatives that instructions regarding "freezing" civilians in critical areas were presently in force and would be continued, pending receipt of further instructions from Commanding General, Twenty-third Army.

The representative returning from Headquarters, Twenty-first Army, in addition to furnishing G-1 with valuable data on all personnel activities in the sector to be occupied, including an overlay of installa-

tions of personnel interest, reported that Twenty-first Army was planning to: (1) cause the physical withdrawal of the 1012th Replacement Battalion, supporting XXX Corps, to the 10th Replacement Depot; and (2) withdraw the military police units now in the Army rear area of our new zone at 1200, 1 September, despite the protest of Twenty-third Army representative to keep these units in place until 5 September. G-1, Twenty-third Army promptly contacted Thirteenth Army Group with reference to these two matters and eventually received authority:

(a) To keep 1012th Replacement Battalion as support battalion for XXX Corps. Thirteenth Army Group directed the transfer of the 1012th Replacement Battalion from the 10th Replacement Depot to the 11th Replacement Depot.

(b) To have military police units of Twenty-third Army take over not later than 1200, 4 September.

### Summary

In the foregoing narrative, an effort has been made to highlight some of the more important initial personnel problems which confront an army G-1 section when the army concerned is involved in a situation such as has been presented. The problems stated are superimposed on the routine voluminous daily personnel staff work ever present in an army headquarters. Particular emphasis has been placed on the *essential information* the army G-1 must seek so that he may intelligently arrive at a sound, logical, personnel plan to support the concentration and the newly assigned offensive mission of the army. It has been pointed out that G-1 secures this needed information by staff visits, conferences, and pertinent messages dispatched to subordinate, higher and other headquarters. Based on the facts obtained, the army G-1 arrives at his conclusions and submits his recommendations to the army commander or chief of staff. Prompt dissemination on all approved details to subordinate units and headquarters is essential. Since planning on the army level is normally projected at least thirty days in advance, the Army G-1 must keep his personnel plan flexible and amend it as additional data is received.

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**During our lifetime neither the improvement of existing weapons nor the development of new weapons are likely to dispense with the war-time necessity of military personnel. We would need men to defend our shores, and to carry the battle—as we must strive to carry it—to the land of the enemy if we are first attacked. Antiaircraft and other defensive bases will be needed on this continent. And the enemy could not be successfully attacked without bases near hostile lands—each one of which bases must be seized by tens of thousands of men, and manned and supported and protected from the enemy by hundreds of thousands more.**

**There must be men in ships and in planes, and men on land lanes and sea lanes of supply. There must be guards for our cities and our vital installations. There must be trained personnel available to meet emergency conditions in any of our communities which may be successfully attacked by air or otherwise. And a conclusive victory will possibly require some eventual invading and occupying force.**

*Secretary of the Army Kenneth C. Royall*

# AIRBORNE ASSAULT CROSSING OF THE RHINE

Lieutenant Colonel David P. Schorr, Jr., *Infantry*

*The following article is one of a selected number of monographs prepared by officers attending the 1946-1947 class of the Command and General Staff College.—The Editor.*

THE latter part of February 1945 found the 17th Airborne Division in the vicinity of Chalons, France. The division was engaged in rehabilitating itself following its participation in the "Battle of the Bulge." The 194th Glider Infantry, located eight miles southeast of Chalons, was primarily concerned with re-organizing under new tables of organization for airborne units, re-equipping and re-training. Prior to 1 March, no one in the regiment was aware, either officially, or otherwise, that an airborne operation was an immediate likelihood.

On 1 March, the Commanding Officer, 194th Infantry, was directed to report to the Division War Room at Chalons. At this time, he received his first information concerning the operation. He was briefed as follows (see Figure 1):

The over-all plan for the Rhine crossing was designed to effect the encirclement of the Ruhr. The main effort was to be made north of the Ruhr by Twenty-First Army Group, consisting of the First Canadian, Second British and Ninth U.S. Armies. This attack was to be supported by a strong secondary thrust from the bridgehead of Frankfurt. The juncture point for these two encircling forces was to be Kassel. Subsequently operations would be launched to destroy organized resistance in the encircled area.

The assault crossing of the Twenty-First Army Group was designated Operation "Plunder." Its principal features were as follows: The Second British Army would make the main effort, assault north of Wesel and concentrate initially on the capture of that town. To assist the advance of Second Army, the First Allied Airborne Army would drop the XVIII Airborne Corps, consisting of the 6th British and 17th U.S. Airborne Divisions, north and northwest of Wesel. The target date for the operation was set as 1 April 1945.

Those features of the Second British Army plan relevant to Operation "Varsity" were as follows (see Figure 2): aerial preparation in the assault area would commence on D-3. Included therein would be the neutralization of enemy air by the bombing of hostile airfields, particularly those used by jet aircraft. The aerial preparation would culminate in the bombardment of Wesel by RAF heavy bombers at 1730, D-1. At 2200, D-1 the British 1st Commando Brigade would cross the Rhine west of Wesel and launch an assault on that town. At 0200, D-day, the 15th (Scottish) Division of XII Corps would launch the main ground assault north of Wesel and drive to the east.

In consonance with the above scheme, the XVIII Airborne Corps would commence its drop at 1000, D-day, with the 17th Division on the south. The 6th and 17th Divisions would be dropped simultaneously

with the complete air echelon of both divisions to be on the ground by 1230, D-day.

The target area assigned to the 17th Division was, in general, a relatively flat rural section, consisting of cultivated fields and pastures. Excellent main and secondary road nets existed. Stone farmhouses, barns and associated buildings were scattered throughout. The western portion of the area was predominantly wooded. Satisfactory drop and landing zones were present. The extreme western portion of the division area overlooked the ground to the west which gradually sloped down to the Rhine River. On the east and south of the area were the Issel River and Issel Canal respectively. Both were approximately thirty-five feet wide, had steep banks and were a definite tank obstacle. Numerous bridges crossed both waterways. The town of Wesel was a principal communication center between the Netherlands and the Ruhr.

Neither at this time (1 March) nor at any time prior to the operation, did the Commanding Officer 194th Infantry, receive tangible information relative to enemy strength or dispositions in the area. Identifications did reveal the presence of elements of the 84th German Infantry Division and an antiaircraft brigade. Aerial photographs disclosed numerous intrenchments and gun emplacements scattered throughout the area, largely of recent construction.

The mission assigned to the 17th Division by XVIII Corps was as follows (Figure 2): To drop during daylight on D-day; seize, clear and secure the Division Area with priority to the high ground in the vicinity of Diersfordt and the bridges over the Issel River in area; protect the right (south) flank of the corps; establish contact with the 1st Commando Brigade, the XII British Corps and the 6th British Airborne Division.

Based upon this mission, the division plan was explained to the Commanding Officer, 194th Infantry. Regimental boundaries were established as indicated in Figure 2. Commencing at 1000 D-day, the division would drop in the order, 507th Parachute Infantry Combat Team, 513th Parachute Infantry Combat Team, 194th Glider Infantry Combat Team. The 507th would drop in drop zone "W," clear its zone, seize objective "A" and assist by fire the assault crossings of the 15th British Division. The 513th would drop in drop zone "X," clear its zone, establish contact with 6th British Airborne Division and with two battalions seize objective "B" and assist by fire the assault crossings of the 15th British Division; one Battalion, 513th Infantry, would seize objective "C" and prevent any enemy crossings of the Issel River in its zone. The 194th Glider Infantry would have the following attachments:

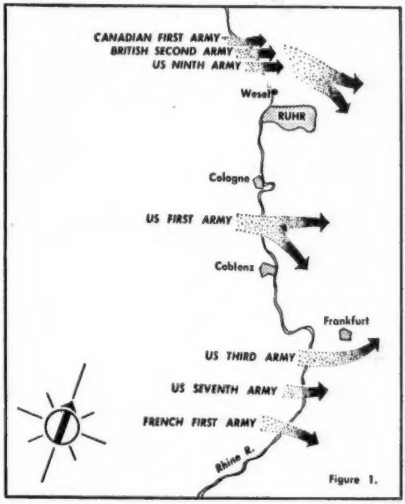
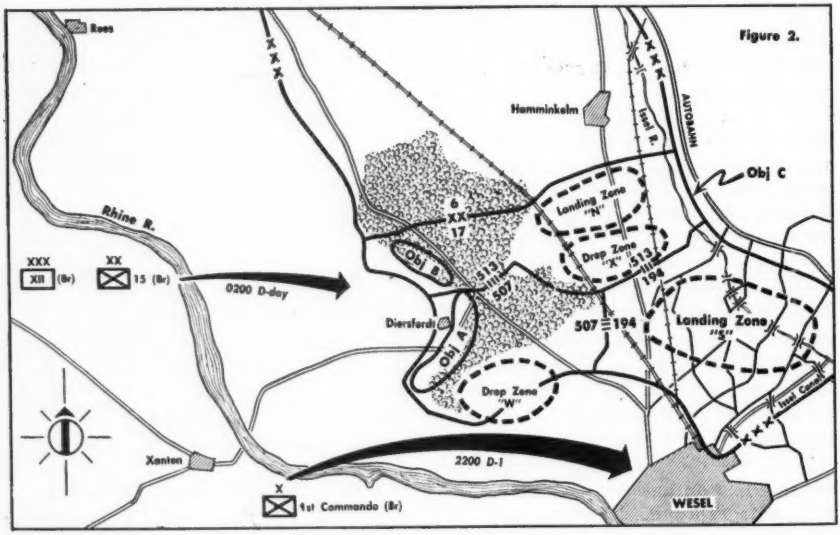


Figure 1.

681st Glider FA Bn 75-mm pack
Btry "B," 155th AA Bn (57-mm AT)
Btry "E," 155th AA Bn (Cal. .50 AA)
Glider Pilots, 435th, 436th, 437th and 439th Troop Carrier Groups, upon land-

ing, (Approximately 875 officers and flight officers.)

The 194th Infantry would land on landing zone "S," clear regimental zone, seize crossings over Issel River and Issel Canal in zone, and establish contact with 1st Commando Brigade in Wesel. One Glider Infantry Battalion of the regiment would be committed only on division order. The remainder of the division would follow the 194th Combat Team landing on landing zone "N."




With this over-all picture as a background and with specific reference to the announced division plan, the Commanding Officer 194th Infantry immediately began the formulation of the regimental plan. Key staff personnel were briefed without delay and on or about 3 March, a firm operational plan for the regiment was evolved (see Figure 3).

The Combat Team would land in landing zone "S" in the order 2d, 1st and 3d Battalions; 681st FA Battalion, Battery B and Battery E, 155th AA Battalion. The 1st Battalion would land in the eastern portion of landing zone "S" and astride the Issel River, seize and occupy objective "D," prevent any hostile penetration from the east, and establish contact with 513th Parachute Infantry on the north. The 2d Battalion would land in the southeast portion of landing zone "S," seize and occupy objective "E," prevent any hostile penetration from the southeast and establish contact with the 1st Commando Brigade in Wesel. The 3d Battalion would land in the northwestern portion of landing zone "S," move to assembly area "F," constitute the division reserve and be prepared for commitment anywhere in the division area. The 681st FA Battalion would land in the central portion of landing zone "S" and render direct support from firing positions in the vicinity of area "G." Batteries of the 155th AA Battalion would land in the central portion of landing zone "S," Battery B to provide antitank protection to the east and southeast; Battery E to provide antitank protec-

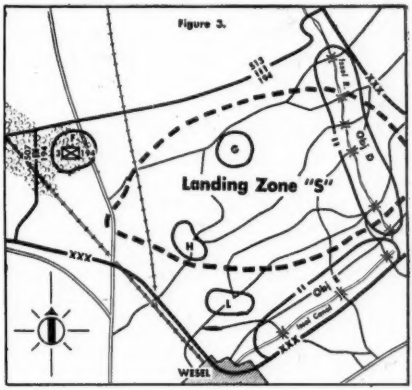
tion from positions in vicinity area "H," paying particular attention to the southwest and west. The plans for employment of attached glider pilots were as follows: Upon landing, pilots would assemble by groups. The 437th Group would be employed in guarding prisoners of war and civilian personnel; the 439th would occupy positions in the vicinity of area "G," effecting close-in small-arms protection for the 681st FA Battalion. The 436th would occupy and defend area "L" to the south; the 435th would prepare, occupy and defend area "H" to the west and southwest.

With this plan as a basis, preparations for the operation went forward. The training, which had been exclusively of a ground nature, was altered to include airborne phases. Loading and lashing instruction was initiated. Sufficient gliders were made available to lift one rifle company at one time, and company problems could be conducted involving tactical glider landings with emphasis on rapid orientation, assembly and combat firing. The ground for such problems was selected for similarity to the Wesel area.

A schedule for the briefing of regimental personnel on the operation was established and executed. It was planned to brief all personnel down to and including Company Commanders, prior to movement to departure airfields. Under the direct supervision of the regiment S-2, a war tent was erected and fitted with necessary sand tables, map boards, lighting equipment etc. The most stringent security measures governed the operation of this installation.

Pertinent administrative measures were instituted with emphasis on a series of show-down inspections, ordnance repairs and vehicle maintenance. The reorganization under the new tables of organization, and the assimilation of replacements was completed.

A total of 345 gliders of the CG-4A type were allocated the regiment for the air movement. Based on this figure, allotments were subdivided among the units of the regiment and loading plans prepared. In view of the fact that a total of 386 CG-4A gliders are required for the air echelon of a glider regiment, only 50 per cent of the ¼-ton trucks and trailers of the regiment were included in the air echelon. Priorities on transportation were established in the order, com-




munication, ammunition, medical and command.

The land tail and base echelon of the regiment were prescribed and organized in accordance with instructions from division.

The Wing Glider officer, 53d Troop Carrier Wing, to which the 435th, 436th and 439th Troop Carrier Groups were assigned, and the senior glider officer of each of these groups, visited the regimental war tent and were briefed on their respective ground missions. It later developed that these officers had not been previously briefed on the impending operation by the Air Force. This occasioned some misunderstandings between the regiment and Headquarters 53d Troop Carrier Wing. Liaison was also established

with the three assigned regimental departure fields in the vicinity of Paris.

Liaison likewise was made with the 1st Commando Brigade in the form of a visit by the Commando Brigadier to the Regimental Group at Chalons. The time and place of establishment of 194th Commando contact in the target area were discussed. Because it was considered likely that the initial contact would be made at night, a ready means of mutual identification was deemed essential. It was felt that the traditional beret of the commandos would afford a most suitable silhouette. In order that the commandos would have some similar means of identifying the airborne troops during hours of darkness, it was decided that the latter would attach their parachute first aid kits to the front of their helmet nettings, thus providing a distinctive outline.

On 16 March, the Commanding Officer 194th Infantry was informed by the Commanding General 17th Division, that D-day had been advanced from 1 April to 24 March. It was further directed that the regimental land tail would move out on the night of 18 March, being consolidated with the division land tail under the command of the Assistant Division Commander. The air assault echelon of the regiment was directed to move by rail and motor to assigned departure airfields closing therein by 2400, 20 March.

The marshalling areas occupied by the regiment were located on the airfields proper. The areas were constructed, operated and secured by communications zone personnel. Strict security measures prevailed relative to the areas, despite the fact that the airfields themselves had not, as yet, adopted their additional operational security measures. In general, the marshalling areas were most satisfactory, each consisting of a pyramidal tent camp enclosed by wire. The briefing facilities were particularly noteworthy in that ample tentage, racks and sand tables were provided.

Briefing of the platoon leaders and enlisted personnel commenced immediately upon arrival. A schedule had previously been prepared for use of the briefing tents and it was placed in execution.

The briefing was conducted twenty-four hours a day. Each individual was thoroughly instructed from the over-all theater picture down to include his own individual assignments.

Loading of gliders commenced at 0600, D-1. Airborne personnel are responsible for the proper loading and lashing of equipment in the gliders. At the same time, however, the glider pilot is responsible that the load in his glider is a flyable load. Thus, in order to avoid any discrepancies, arrangements had been made with Troop Carrier Wing for the glider pilots to be present with their respective gliders during the loading phase. As it developed, however, very few pilots were present. This was occasioned by the fact that it was not until 1300, D-1, that the pilots were informed that an actual operation was on. Heretofore, the pilots had been of the opinion that the presence of the airborne troops on the field was in the nature of a "dry run." The loading was completed by mid-afternoon, however, and commencing at 1800, D-1, gliders and tug aircraft were "stacked" on the runways in take-off formation.

At 1300, D-1, the airfields were closed and the pilots' briefing was conducted. The senior airborne officer, present on the field, attended this briefing. Immediately following, the glider pilots were marched to the airborne marshalling area where they received a five hour briefing on their ground missions. Upon completion of this instruction and realizing that the operation was not a "dry run," the glider pilots immediately proceeded to the runways, located their gliders and checked their respective loads. This resulted in a considerable amount of confusion and re-

adjustment of loads which adherence to the original plan would have averted.

The weather D-day morning was most favorable. Following the police of the marshalling area, the units of the regiment marched to assigned gliders. The leading serial of the regiment took off at 0730. The gliders were double-towed behind C-47 aircraft. Time of flight to target area was approximately three hours. Fighter escort was provided for the air column and the flight to the vicinity of the Rhine was without incident.

The Rhine was approached at an altitude of approximately 2,000 feet. A dense haze existed, caused by the smoke screen of the Second British Army and by the intense artillery preparation. After crossing the river, antiaircraft fire of all types became intense. It had been planned to release the gliders at an altitude of 600 feet. However, due to the intense haze, the gliders released at an altitude of 1,000 feet. Despite the haze and antiaircraft fire, the glider landings were exceedingly accurate. This was due entirely to the skill and fortitude of the glider pilots.

In the eastern portion of the landing zone, scattered resistance only was encountered; in the western portion, however, a strong, stubborn resistance was met. It was apparent, however, that operational surprise had definitely been achieved. The first prisoners captured were in a state of complete bewilderment. All the units of the regiment and the glider pilot groups assembled rapidly, and by 1700, all assigned objectives had been secured. By that time 1,150 prisoners of war had been captured. The speed of assembly and of the subsequent ground action can be wholly accredited to two factors: one, the extremely accurate glider landings in the face of formidable obstacles; second, the exhaustive and accurate briefing which each individual soldier had received. The actual ground action was executed almost without exception in the exact manner envisioned, planned and directed.

During the night of D-day—D+1, numerous enemy counterattacks were repulsed. These attacks ranged in strength from platoons to reinforced rifle companies and included from one to four tanks. One of the stronger of these counterattacks came from the west at approximately 2300, D-day, and was directed against area "H." The glider pilots of the 435th Troop Carrier Groups, who occupied that area, repulsed the attack in a most effective and creditable fashion, inflicting heavy casualties on the enemy and destroying two enemy tanks.

Early in the morning of D+1, contact was established with the 1st Commando Brigade in Wesel. On the afternoon of D+1, contact was likewise established with the Guards Armored Brigade thus concluding the airborne assault phase.

In his report to the Combined Chiefs of Staff, General Eisenhower made the following comment relative to this operation: "Operation Varsity was the most successful airborne operation carried out to date, and the brilliant results reflected the great strides made in this aspect of warfare since the landings of D-day, nine months earlier."

### Lessons

1. *Time of Attack.*—It will be recalled that the airborne assault commenced at 1000, D-day, or some eight hours *after* the principal ground assault. Previously, all airborne assaults in the European Theater had preceded the ground or amphibious assault. Thus, the reversal in the timing of operations "Plunder" and "Varsity" constituted an innovation. An analysis of the two operations has indicated that the timing employed was the most significant factor in securing operational surprise both for the ground and airborne assaults. Captured documents and statements of prisoners of war disclosed that the enemy anticipated the employment of

Allied airborne forces in conjunction with the Rhine crossing, and further, that the Wesel area was considered as a likely assault area. This latter fact is further substantiated by the arrival in the Wesel area on 23 March of an additional anti-aircraft unit. However, when the 0200 ground assault was not preceded with airborne forces, it appears that this situation negated, in the estimates of the enemy, the probability that Wesel would be an airborne target. Thus, the appearance of troop carrier aircraft in the area eight hours after the initial assault came as a distinct surprise.

2. *Delivery of airborne forces in mass.*—In previous airborne operations in the European theater, the airborne forces had been piecemealed into the target area over a period ranging from twelve hours to two and one-half days. This condition was largely provoked by lack of suitable aircraft in sufficient numbers. In Operation "Varsity," the complete air echelons of both participating divisions were dropped within two and one-half hours. The principle of mass has long been an acknowledged precept of war. However, in its application to airborne operations it becomes paramount. Mass, particularly considered in terms of time, not only aids the airborne forces to overcome one of its most formidable enemies—weather, but it also enables the airborne units to capitalize fully upon its most priceless asset—surprise.

3. *Glider landings on previously unsecured fields.*—When the 194th Glider Infantry landed in landing zone "S," it marked the first time that a glider unit had intentionally landed in a field which had not been previously cleared and secured by parachute troops. The landing was eminently successful. The regiment suffered approximately 9 per cent casualties in the air and during the landing proper. This is a relatively low figure, particularly when it is considered that the flight and landing of 345 loaded gliders under *simulated* tactical conditions will produce a certain number of casualties. The principal factors producing this success were the existence of suitable landing fields, surprise, and the dexterity and courage of both tug and glider pilots. In addition to the relatively low casualty rate, the landings were extremely accurate. Only 24 per cent of the gliders landed outside the prescribed zones and the bulk of these were within 300 to 500 yards of the zone. No evasive tactics whatsoever were employed by the tug pilots prior to the release of the gliders. This was most conducive to the accuracy attained. It naturally follows, from this feature of the operation, that it is perfectly feasible for glider units employing the CG-4A type glider, or its equivalent in maneuverability and landing characteristics, to land in previously unsecured fields. The fundamental requirement is surprise.

4. *Employment of glider pilots after landing.*—The fundamental principle relative to the disposition of glider pilots following an assault landing is to evacuate them at the first opportunity. The glider pilot, being a specially trained individual, should not be unnecessarily exposed to combat action on the ground nor required to perform missions inconsistent with his future use as a pilot on subsequent airborne operations. In consonance with this principle, it has become routine to employ the pilots on such tasks as traffic control, securing the prisoners of war and civilians, defense of the Command Posts of the larger units, and similar assignments. Due to a lack of organization, chain of command and training, particularly in assembly procedure, the ground operations of the pilots in previous operations had been most unsatisfactory. This was particularly evidenced during Operation "Market" (airborne assault on Holland) when hun-

dreds of pilots roved through the target area in unorganized groups with the primary purpose of visiting Brussels.

With the knowledge of the above as a background, the Commanding Officer 194th Infantry also considered the following factors in the assignment of missions to the pilots upon landing:

*a.* The need for close-in protection to the supporting field artillery battalion and a more pressing need for security to the west and southwest in the regimental zone. This need was made more severe by the fact that the 3d Battalion of the regiment, being in Division Reserve, was not at the disposal of the Commanding Officer.

*b.* The number of pilots involved totalled approximately 875 officers and flight officers. It was felt that the employment of this entire force on Command Post, Prisoners of War, and civilian security missions, was not only excessive but would constitute a most inefficient use of this available manpower.

*c.* It was likewise felt that the individual pilot would be equally if not more secure in a prepared defensive position of a secondary character, than if he were loitering around a Command Post or Prisoner of War enclosure.

*d.* The most important factor considered was the fact that 50 per cent of the glider pilots who would be attached to the regiment had just recently completed an intensive four week's training in ground operations. Emphasis in this training was placed on assembly following assault landing, firing of all weapons to include BAR, LMG, rifle, carbine, pistol, bazooka and grenades, scouting and patrolling, platoon and squad tactics, field fortifications and first-aid.

Having assigned the ground missions, it was then planned to organize the pilots into a provisional battalion composed of four companies. One company would be formed from each of the four participating Troop Carrier Groups. The command of this force would remain in Air Force channels. The Commanding Officer 194th Infantry dealt with the Commanding Officer of the provisional battalion in the same manner as he did with any of the organic battalions of the regiment. In order to assist and guide the battalion and company commanders of this provisional force, five airborne officers of company grade were "loaned" to the provisional battalion commander. These officers acted as technical advisors to the air force commanders on matters relating to the emplacement of weapons, construction of fox-holes, tactical dispositions, and in any way the provisional commanders desired. The airborne officers would not, and did not, exercise any command whatsoever. In addition, the regiment obtained and issued to the provisional battalion, additional weapons and equipment in the form of LMGs, bazookas, grenades of all types, rifles, BARs, radios, pyrotechniques and sound-powered telephones.

The performance of the pilots in their ground operations was superior. They were most enthusiastic about their missions, assembled promptly and executed the plan exactly as prescribed. The repulse of the enemy counterattack on D-day night by the 435th Group was particularly noteworthy. No undue casualties were incurred by the pilots in the performance of these missions and it is not believed that this employment, though previously considered inadvisable, in any way jeopardized their future employment. The attached pilots conclusively proved that given proper training, organization and weapons they constituted an effective force for ground employment which, if judiciously and sanely used, no airborne commander can afford to overlook.

# German Underground Installations

*This account of German underground installations is from the report for the Secretary of the Army, "Foreign Logistical Organizations and Methods," prepared by a board headed by Major General C. F. Robinson, U. S.A.—The Editor.*

GERMAN underground installations were of various types. For the most part the Germans adapted existing facilities to underground storage or production. Mines, caves, beer cellars, railroad tunnels, highway tunnels were remodeled to varying degrees to house manufacturing or storage that had previously been above ground.

All types of mines were used; potasium, sodium, chloride, salt, iron ore, saltpeter, gypsum, potash, silver, zinc. Some sites were greatly enlarged; others used as they were. Remodeled mines were used for the storage of ammunition, gasoline, clothing, rubber; the manufacture of automatic pilots, direction gyroscopes, ammunition, precision instruments, components for aircraft, airplane engines, ball bearings, guns; and the generation of electricity. The floor space in adapted mines varied from only a few thousand square feet up to several hundred thousand square feet.

### Various Types

Railroad and highway tunnels were used for the manufacture of planes, engine parts, ammunition and electrical equipment. Conversion measures generally consisted of installation of lining, lighting, mechanical ventilation, bomb-proof closure walls, sewage disposal, removal of seepage water, and water supply. The tunnels were of varying floor space. One tunnel three kilometers long was used for the manufacture of ammunition.

Brewery vaults were used for the manufacture of airplane parts, chemicals, liquid oxygen, ball bearings, engine parts, and storage. Generally little conversion was undertaken at these sites. The vaults were of various sizes generally under 50,000 square feet.

Caves were used for the manufacture of gears, radio tubes, ball bearings, and storage. In one case a nine story building and in another case a four story building was erected in a cave.

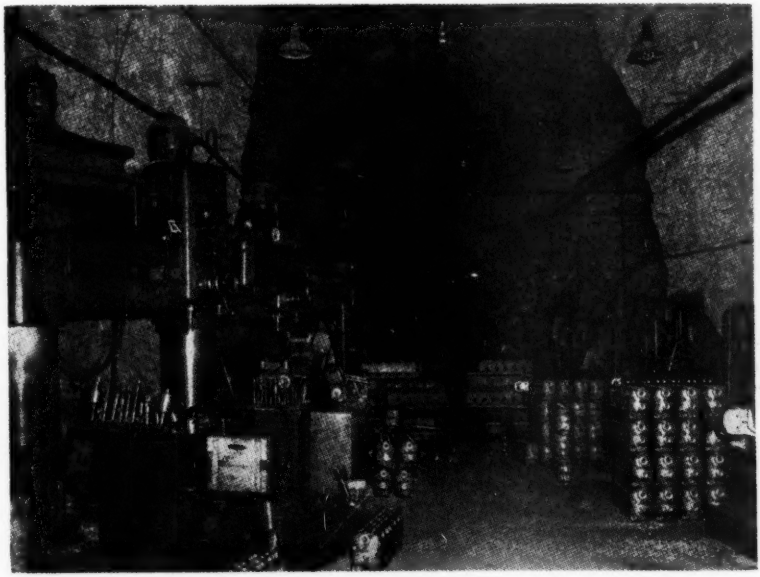
The Germans also undertook new construction of underground facilities. These generally consisted of two types; tunnels or galleries excavated into the side of hills and buildings placed wholly or partially underground with a bomb-proof covering. The so-called *bunkerwerke* with heavy reinforced concrete arches over the top was of the latter category. New construction was generally confined to the large plants of the major programs for moving critical industries underground. Except in the field of ammunition manufacture and storage very few of the new projects undertaken were completed by the end of the war.

Of the 239 verified underground installations, only seventy-four or about

per cent were new excavations. Seventy-two or 30 per cent were in pre-existing mines. The remainder were scattered among natural caves, rail and highway tunnels and beer cellars.

### Construction Features

The underground installations utilized by the Germans varied greatly in construction details and the facilities provided.



**German aircraft engine factory in a quarry.**

Generally speaking, structures which were built by the government under central supervision and as part of a major program, were substantial. Design, construction and camouflage were of high standard. The design methods and standards used in planning these installations were quite similar to those used in comparable work in the United States, except that drawings were not well detailed or complete. In the case of certain types of structure, where the Government had ordered many similar plants, standardization was very evident. This was true in ammunition plants, oil storage, aircraft planes and synthetic petroleum plants.

On the other hand, the majority of underground installations were makeshift arrangements. This was particularly true where they were left to local governmental agencies or private enterprise. Improvisation and expediency caused by the urgency of the situation were controlling factors. Designs varied with the importance of the structures and the abilities of the local engineers, architects and contractors. Generally speaking the conversions of existing sites were hasty improvisations that did not begin to compare with American standards for production facilities or in provisions for the

comfort and welfare of workers. Many of them were extremely crude and primitive. Much hand labor was used and equipment and construction organization were usually much below American practice.

In the selection of existing underground sites for storage or production purposes, consideration was given to size, the possibilities of enlargement, transportation facilities, sources of power and water, and the extent of remodeling that would be required. The selection of new sites was to a considerable extent influenced by the geologic environment. One of the most common types of rocks chosen was moderately soft sandstone. This rock was easy to excavate and at some places self-supporting. However, the sandstones varied in hardness and consistency and at several sites it was so weak and unconsolidated that serious rock falls resulted, heavy timbering was required, and the tunnels eventually had to be lined with reinforced concrete. Two other types of rock commonly exploited were massive anhydrite and limestone. Both were excellent because they could support tunnels of good height and width without bracing or lining. Tunnels were also excavated in such soft materials as shale and gypsum because of the shortage of explosives. Careful attention was paid to natural concealment and overhead cover. Access to utilities was also considered as in the case of existing sites. In addition, the availability of construction materials was also an important factor.

As a guide in the selection of sites and construction of underground facilities the Germans developed the following minimum standards; height 3 to 4 meters, width 6½ meters, and length 50 meters. These were not always followed. For example, in some cases widths of 2½ meters were used.

### Utilities

There was a wide range of provisions for utilities. The extent of the utilities layout depended on the importance of the structure and the time allowed for construction. In the majority of the conversions, the existing sites were poorly lighted with the bare minimum of other utilities. On the other hand, a few structures had elaborate facilities for water, sewage, heating, light, power, gas-proofing, ventilation, kitchens and mess halls. These structures usually had standby power and various manually-operated devices in case of total power failure.

Floors were normally concreted. The roofs were almost always arched so that they formed one continuous surface with the walls. Because of the urgency of getting production underground and the general shortage of construction materials, roofs were almost always left unlined, if the rock was self-supporting. In some factories which were sited in sandstone, the walls and ceilings were sprayed with a thin coating of cement in an effort to reduce dust in the factory. This process, while rendering the rooms relatively dust free, was dangerous because it concealed weak spots in the tunnel ceilings. All types and combinations of building materials were used for lining tunnels, such as brick, stone, concrete reinforced with steel arches, and even timber.

Two types of ventilation were used; one in which the tunnel itself was used as an air duct, and the other in which the air was conveyed about the factory in metal ducts and only entered the working areas when it was blown out of holes in a duct on one side of a tunnel and then drawn into another pipe through holes on the opposite side. Fiber board was used as a substitute material for ducts but was generally unsuccessful because it became warped by the hot air. Many different sizes and types of ventilating fans were used at first but later this equipment was standardized in order to facilitate production and the interchange

of equipment. Fans were in very short supply and their lack greatly delayed the installation of ventilating systems. In production rooms it was directed that the relative air humidity should not exceed 60 to 70 per cent and the average air temperature 68° to 78°F. In mess rooms the humidity was not to exceed 50 to 60 per cent and the temperature of the air 68° to 78°F.

### Camouflage

In camouflage the Germans excelled. Whether concealing totally-underground structures or partially-underground structures and entrances, exits, smoke stacks, ventilation ducts, they displayed unquestioned zeal for this activity. Full use was made of natural cover and installations invariably blended into the surrounding countryside. The natural ground surface was disturbed as little as possible. In many cases, immediately after construction, pine trees were planted over disturbed surfaces. The majority of the munitions plants and oil depots were buried in dense forests.

The most unique construction was that of the four semi-underground Messerschmitt factories near Munich. These factories were unusual in that the roof was a 10-foot reinforced-concrete arch of 280-foot span; the roof arch was poured on a 162,000 cubic yard gravel fill which had to be excavated after the arch concrete had set; the five and eight story buildings constructed underneath these roof arches were made entirely of precast columns, beams and floor slabs; and, the heating and ventilating designs were larger and more elaborate than those for any other underground factories.

The Germans apparently did not develop, through experience or experimentation, any conclusive standards of cover for protection against different types and sizes of bombs. At first, concrete of three meters thickness was thought to be sufficient protection. The experience on the Atlantic Wall indicated that six meters of concrete was sufficient. As the allies used larger and larger bombs this was revised upward to the point that 10 to 12 meters was thought necessary for complete protection. The bombing in France indicated that 20 meters of cultivated ground would withstand medium bombing. A top layer of 30 to 40 meters thickness was finally considered the minimum protection against medium bombs. Some German engineers arrived at the conclusion that 60 to 80 meters of rock cover was the only really safe protection.

Several separate agencies of the German government were involved in the selection and construction of underground sites. In the early years of the war the Organization Todt was charged with this responsibility in occupied territories. In Germany proper, the Ministry of Economics, the Ministry for Armament and War Production, the Air Force and the SS all had a part in these activities. In May 1944 after the Organization Todt was placed in the Ministry of Armament and War Production and the effects of allied bombing had increased the importance of moving underground, an attempt was made to concentrate the underground functions in the Ministry of Armament and War Production. This effort was successful except for the Building Section of the SS which still retained part of the construction, and in some cases, the operation of underground plants. In addition to the normally independent and untouchable status of the SS within the German government, only the SS had the necessary manpower and was able to guarantee completion dates in view of the difficult economic developments. The SS had also the greatest experience in the building of underground space, as it had participated in the installation of underground plants for the aircraft industry and V-bomb production.

### Costs

The average cost of buildings on the surface in Germany was 80 to 150 *reichmarks* per square meter. In favorable cases involving only the leveling off and concreting of existing underground sites, the cost of underground plants was as low as 30 to 40 *reichmarks* per square meter. The average cost of underground plants, however, was about 300 *reichmarks* per square meter. Some costs in hard rock with extensive ventilation ran as high as 1,000 *reichmarks* per square meter.

In general the conversion of a mine into a factory was the least expensive type of underground protection. The construction of a factory by excavating new tailor-made tunnels was the most expensive. The costs for the latter type ran as high as ten times as much as an above ground factory of the same floor space. The Commissioner General for the Chemical Industry estimated that it was three times as costly to build underground plants as surface plants. The installation of the Daimler-Benz aircraft engine plant in a gypsum mine at Neckarelz, however, is said to have cost less than the original surface building which was bombed out. Some of the most important factors governing the cost of a new excavation was the selection of a thick bed of self-supporting rock at valley level, the proving of the site by trial borings, and supervision of the excavation by experienced mining engineers.

One German technician estimated that the construction of almost all plants of the chemical production plan, except for powder and explosives, should have been possible as private enterprise, even where the slightly increased production costs due to war conditions required certain guarantees by the Government. For underground construction, with considerably more expensive methods, private enterprise was out of the question.

In optics and precision instrument production the Germans were able to reduce maintenance and operating costs in securing proper temperature and humidity by taking advantage of the more constant conditions prevailing in underground facilities.

### Effect on Workers

The physiological effects on the workers varied, depending on local conditions. In factories that were properly ventilated and where the welfare of the workers was considered, there were no adverse physiological effects. In fact the incidence of colds decreased in some factories because of the uniform controlled humidity and temperature of the air. Ultraviolet ray treatments were available in some factories. Generally underground work was limited to eight successive hours. Many new workers complained of headaches at first but this condition vanished after one or two weeks work. These headaches were thought to have been caused by the fact that the air pressure was greater than outside due to the forced ventilation systems.

Psychological effects varied in general according to whether or not the individual worker had been employed in an above ground factory that had been bombed. Those that had survived bombing attacks on above ground factories were glad to work underground because they felt safer, while workers who had not been bombed generally did not like to work underground because of the lack of sunshine. However, daylight type strip lighting was not uncommon and the walls were sometimes painted a light green to make the light easy on the eyes.

### Effect on Production

Many German engineers claimed that the cost of production in an underground factory properly designed and equipped and built without interference by enemy bombing could and should have been less

than an above ground plant of the same floor space. Production capacity in underground plants should in general correspond to normal production in workshops on the surface. The employees generally enjoyed working in the underground shops so long as the management made the necessary arrangements for their welfare including illumination, ventilation, transportation, sanitary, and messing facilities. Through the necessity of having to supply a good noon meal in the shop, the German workmen no longer had to go home at noon for their meals. The greatest difficulty with labor was in providing housing. It was common practice to build dispersed hutted camps near the factories and also house workers in nearby villages. The transportation of workers was by foot, bicycle, bus and train, depending on the distance and facilities available.

Production quality did not drop. The same type of tools were used and the same standardization of working methods was followed as above ground. The work benches were closer together, making supervision simpler. Transportation of supplies inside the better factories was generally by overhead electric cranes or small electric cars. Interruption of work through disturbances and like incidents, for example day air raid alarms, ceased. Many sites, such as mines, already had rail-sidings and most newly excavated sites were built near railway lines so that only the construction of short spurs was needed. The biggest bottleneck in production was in getting goods in and out of the vertical shaft mines. This problem was being solved by the excavation of additional shafts, both verticle and sloping.

The average loss of production in moving to underground locations was three weeks to two months depending on the industry, the size of the plant and transportation difficulties which became increasingly worse from allied bombing.

The Germans found that all light industries were adaptable to underground sites and that there were no special difficulties in putting such production underground. The Germans also believed that it was feasible to place synthetic oil plants and aircraft assembly underground and still achieve economical production. Chemical and power plants were extremely difficult but the Germans were confident that they could have solved the problems involved.

The most serious weakness in the underground and dispersal program was the reliance on the railroads for transportation. Most of the plants depended on railroads both for their raw materials and distribution of their products. This contributed to the overloading of the railroads, which were already severely damaged by aerial attacks. The condition was further aggravated by the general lack of storage space for either materials or finished products at the plants. For example, in the case of an underground liquid oxygen plant at Wittring production had to be discontinued when the main line railroad bridge leading to the plant was destroyed by bombing. The aviation-fuel plants, furthermore, would still have been vulnerable if these plants had been put into operation, because of the vulnerability of the transportation from the carbonization or coal hydrogeneration plants on which the underground plants relied.

## Conclusions

Allied strategic bombing was so disrupting to German industrial production in the last year of the war that it caused the Germans to embark in the summer of 1944 upon a broad program of placing important war industries underground. The Germans did not succeed, however, in getting any substantial production from underground plants before the war ended.

The original mistake was in overestimating the effectiveness of air defense and

underestimating the power of allied air attack. Because of the period required for construction and transferring production to new sites, the Germans should have started moving underground at least three years earlier. By the time the Germans started to really dig on a broad basis, it was too late. This fact was recognized at the time by many German officials who believed that the requisite materials and manpower could be used to better advantage than in the belated attempt to go underground. The German experience shows that the time to prepare underground sites is before, not during, a war.

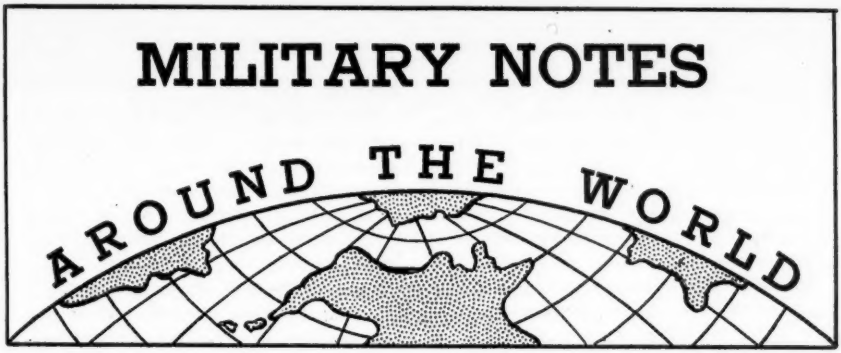
Although the Germans did not get widespread underground production in operation, they had proceeded to the point where most authorities believed that it was practical to place almost any type of industry underground. The greatest difficulties in doing so were in chemicals and power. The major German underground effort was directed to synthetic oil, aircraft, ammunition, and V-bombs. Production underground could generally be maintained at the same standards and costs as above ground. There were no adverse effects on workers. The initial cost of underground plants was, however, except in rare cases, in excess and often greatly in excess of those for comparable plants on the surface. Maintenance and operating costs were on the other hand favorable and sometimes less than above ground.

The great majority of the German underground plants that did get into operation were in existing mines, caves, cellars and tunnels. These generally were hasty, crude improvisations. They went to show, however, that the highly complex equipment of modern war can be produced under almost primitive conditions.

The German experience indicated that it was better to build a few large centralized underground factories, especially designed for the specific product in question, and as self-contained as possible, than to scatter production in a large number of small dispersed or underground units. To do so minimized maintenance, operation and production costs; permitted better supervision; and tended to overcome transportation difficulties. The fact that the German practice in those plants which got into operation was generally the opposite was because the Germans started too late and had to improvise in hastily remodeled existing sites.

But finally, and most importantly, the German experience indicated that underground plants were not a complete answer to maintaining war production under heavy air attack. While the underground plants themselves were not effectively damaged by bombing, lines of communications leading to and from the plants were disrupted and in many cases knocked out by persistent re-attack thus slowing down or completely stopping production. The Minister of Armament and War Production, Albert Speer, questioned the desirability of the entire underground program and thought it was a waste of materials and manpower for this reason. The vulnerability of the transportation facilities was so great that many responsible Germans admitted that persistent bombing of the railroads could have paralyzed industry even if the dispersal and underground program had been completed.

# MILITARY NOTES




## TURKEY

### *Transfer of Vessels*

Under Public Law 75, 80th Congress, the United States Navy is transferring four submarines and eleven other ships to Turkey. The other vessels include a gasoline tanker, a repair vessel, eight motor minesweepers, and one net-laying vessel. All vessels except the submarines are to be delivered to Turkish crews in the United States.—*The New York Times.*

## CANADA

### *"Exercise Moccasin"*

Nineteen men of the Royal Canadian Signals and eleven Royal Canadian Army Service Corps personnel spent a cold winter just south of Fort Churchill, Manitoba, where they lived for eight weeks in temporary camps of tents and igloos or on the trail.

Signalmen tested service radio equipment and ground wave ranges, while the Royal Canadian Army Service Corps gained valuable experience in operating tractor trains for supply duties. This exercise was named "Exercise Moccasin."

Two mobile signal stations traveled in snowmobiles towing sleds, spending twelve days at each temporary station they set up. RCASC personnel operated tractors pulling a "train" of 10-ton sleds and a caboose. Three men formed the crew of each train.—*Canadian Army Journal.*

## GERMANY

### *Dismantling of Industry*

A revised plan for the dismantling of German industrial plants in the United States and British occupation zones calls for dismantling of only 682 of the 1,600 plants originally contemplated.

Of the 682 plants, 302 are strictly war plants, and 380 are non-military industrial units. The plants remaining are considered adequate to permit the industrial capacity of Germany to rise to the level of 1936, the last year in which Germany pretended not to be preparing for another war.—*The New York Times.*

## ARGENTINA

### *New Air Organization*

The Argentine Air Force has been reorganized by government decree, making it co-equal with the Argentine Army.

The decree creates a Commander in Chief of the Argentine Air Force, under whom comes the General Staff, the General Command of Bases, and the General Office and Orders Office of the Air Force.

Commands set up under the decree include Military Aeronautic Institutes, Defense, Bomber, Exploration and Liaison, and Air Transportation. The Superior School of Air War, the Superior Institute of Military Aeronautics, will come under the Commander of the Air Force.—*Aero Mundial Suplemento Argentine.*

## CHINA

### *Ration Development*

The Chinese Quartermaster Service, Combined Service Forces, Ministry of National Defense, is confronted with the problem of supplying rations to a large armed force engaged in many types of operations over huge expanses of territory.

To meet this problem, a large-range plan has been made for the manufacture and preservation of food supplies. The Chinese were aided in these plans by a group of United States Quartermaster experts.

**Chinese Girls Weighing and Packaging Rations for Field Use.**

The plan includes the operation of a pilot factory for modern canning, drying and freezing, and for this purpose a modern factory in Shanghai has been acquired.—*The Quartermaster Review.*

### *Wolfram Ore to Russia*

The bulk of the world's production of wolfram ore, essential in manufacturing guns, armor plate and tungsten-steel, has been going to Soviet Russia. South China produces about three-quarters of the world's supply of wolfram, principally from mines in Kwangtung, Kwangi and Kiangsi provinces. During the first six months of 1947, Russia obtained about 70 per cent of the South China output.—The United Press.

## FRANCE

### *Maginot Line*

The Maginot Line is being rebuilt by the French army, with the intention of including it in the future system of national defense. According to French military views, the value of fixed defense installations was never called in question by World War II.

Part of the defense works of the Line is being used at present for sheltering French civilians without homes and as quarters for coal miners employed in neighboring mines. Other portions are used as quarters by the army and for storage.

The Maginot Line was completed in 1928 at a cost of ten billion pre-war francs. It stretches more than 320 kilometers along the French-German frontier. Twelve million tons of concrete were used in its construction. Altogether the Line comprises three hundred large fortified works of reinforced concrete with a wall thickness of from 3.6 to 4.5 meters, over 1,600 kilometers of fire trenches, and 2,560 kilometers of antitank obstacles.

Results of heavy fire on the Line are of especial interest. During the German attack on the Schoenenberg works in the vicinity of Montmédy from 16 June to 1 July 1940, the fortification was struck by fifty bombs weighing from 2,000 to 3,000 pounds; one hundred twenty 1,000-pound bombs; twelve 42-cm, and thirty 33-cm shells; and by approximately 5,000 smaller projectiles. When the troops surrendered the fort, it had suffered no serious damage. All weapons and guns were in working condition. There had been 700 deaths among the crew of 9,500 men.

During the occupation, the Germans systematically dismantled certain portions of the Maginot Line, carrying away guns, optical instruments, ammunition and other items of use for their war effort.—*Allgemeine Schweizerische Militärzeitung*, Switzerland.

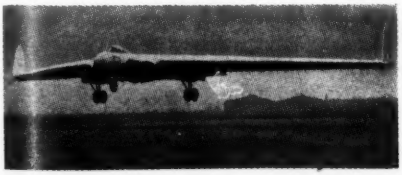
# GREAT BRITAIN

## Royal Marines

A change in the organization of the Royal Marines in the United Kingdom has been announced. At present there are three Royal Marine groups, at Chatham, Portsmouth and Plymouth, each discharging similar functions. In the future, each of these groups would discharge a specific and separate function. A central pay and records system would be located at Chatham. Preliminary recruit training would be at Deal. All training for sea service and similar purposes would be located in the Portsmouth group; and all land service training would be at Plymouth. This change would give greater efficiency in training, and would effect a saving of approximately 1,000 officers and men.—*Journal of the Royal United Service Institution.*

## British Flying Wing

Among the advanced designs of aircraft developed in Great Britain is the Armstrong Whitworth-52, which flies at approximately 500 miles per hour. The plane was built for the Ministry of Supply, under its post-war research program. The flying wing plane has a wing span of 90



**Britain's Armstrong Whitworth-52**

feet the wings sweeping back at an angle of 35 degrees. Two Rolls-Royce Nene jet engines provide the power for the plane, which has a normal range of 1,500 miles at 36,000 feet, but this can be increased by extra fuel tanks to 2,130 miles.—*The Sphere*, London.

## Helicopter Spotter

The Royal Artillery is using helicopters as observation posts for mobile gun-batteries in training at Larkhill, England. In action, a helicopter flies high enough for the observer to see the burst, and corrections are radioed to the command post from where the necessary data is passed on to the battery.

The system of Royal Artillery training with helicopters was worked out with

**Helicopter with 25-Pounder Battery.**

the Ministry of Supply and the Royal Air Force. Royal Artillery pilots undergo two years of instruction with the Air OP Squadron, RAF, before returning to Army duties.—*The Sphere*, London.

## Long Submarine Test

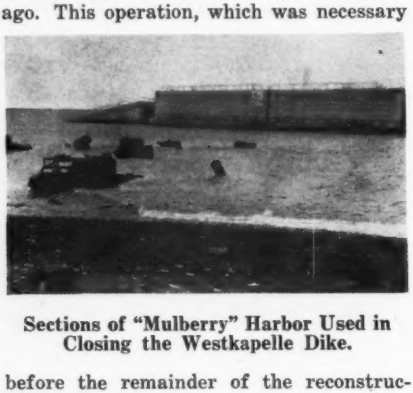
The British Admiralty has announced the successful completion of tests in which the 1,250-ton submarine, *Alliance*, remained underwater for "several weeks." Previously two to three days was the limit of submersion. The tests were conducted by the submarine off the coast of Sierra Leone, Africa.

It was learned that the *Alliance* was fitted with an improved version of the German *Schnorkel*.—News reports.

## THE NETHERLANDS

### *Walcheren Reconstruction*

Reconstruction of Walcheren, the island at the entrance to the estuary of the Scheldt, has been a big task for the Dutch people. The island suffered German bombing in 1940, and in October 1944 was flooded as a result of RAF raids which made four breaches in the dikes. It was also heavily damaged in the fighting which followed the landing of British and Canadian forces. Closing the breaches in the dikes was finally completed a year ago. This operation, which was necessary



**Sections of "Mulberry" Harbor Used in Closing the Westkapelle Dike.**

before the remainder of the reconstruction work could be pursued, was helped by the use of sections of "Mulberry" harbor, brought from the invasion landing beaches in Normandy.—*The Illustrated London News.*

## DENMARK

### *Aircraft Agreement*

By an agreement between Great Britain and Denmark, British aircraft and equipment to the value of 450,000 pounds sterling have been sold to the Royal Danish Government. The aircraft included 26 Spitfires, 5 Sea Otters and 44 Oxfords. The equipment included spare engines, maintenance spares, signals equipment and synthetic trainers.—*Journal of the Royal United Service Institution.*

## AUSTRALIA

### *Rocket Range*

Additional security measures protecting the Central Australian rocket range have been announced. A special amendment to the National Security Regulations gives the Government power to declare the rocket range a prohibited area. The Crown is permitted to search unauthorized persons found on the range if this is considered necessary. Provision has been made for compensation to property holders for any loss or damage they may suffer from the rocket tests. Over 1,000,000 acres will be declared a prohibited area. This will include a huge tract northwest of Woomera in South Australia, which is the firing point.—*Australian News Summary.*

## ITALY

### *Scrapping of Submarines*

By agreement among the four Allied Powers, Italy has been permitted to scrap instead of sink the thirty-one submarines remaining to her at the end of the war. The Italian Foreign Ministry said that the machinery and scrap metal would be used for Italian industries, and that the salvage operations would provide winter work for the unemployed. The thirty-one submarines are all that remained of Italy's pre-war fleet of 110 underwater craft.—*The New York Times.*

## RUMANIA-HUNGARY

### *Military Pact*

Rumania and Hungary have signed a 20-year friendship and military treaty, providing for joint military action against any attacking nation. It was reported that the treaty commits both governments to "support and encourage all movements which aim to exclude instigations of aggression and to secure peace all over the world."—The United Press.

# USSR

## Research Organization

The earnestness with which scientific research is being conducted in Soviet Russia is evident from the following:

In 1915, Russia possessed 120 to 150 centers of scientific research. By 1939 the number had risen to 2,256. At the beginning of 1939 there were 100,000 students, while the number by 1940 had increased to 600,000. The number of scientists occupied in research institutes has been given as 34,600, while the total number of persons occupied in them is said to be 80,000.

The Russian Academy of Science plays a very important role. According to the report of a Swedish scientist who visited the institution on the celebration of its 220th anniversary in June 1945, the Academy's research institutes are in a state of rapid expansion and, as regards equipment and personnel, comparable only with the largest similar institutions in the United States. The activities of the institutes during the war were concerned largely with solving military problems.

The Russian institutes for scientific research come under the Academy of Science which is directly subordinate to the People's Commissariat. By close contact with its various departments and with industry, the Academy is able to regulate activities not only in the field of fundamental research but also in the application of science to industry, agriculture and defense.—*Kungl. Krisgvetenskaps-Akademiens Handlingar och Tidskrift*, Sweden.

## Armed Forces Budget

The budget proposed by the Russian Finance Minister for 1948 calls for an expenditure of 387 billion rubles, of which 66 billion rubles, or 17 per cent, is for the armed forces. The official value of the ruble is 5.3 rubles to one United States dollar.—News reports.

## Soviet Armed Forces

**Soviet Armed Forces and equipment were featured prominently during the last celebration of the Russian Revolution in Moscow. Above, heavy cruiser tanks on parade.**

**Above, rocket launchers mounted on trucks in the Moscow parade. Below, military motorcyclists carrying machine carbines, with LMGs mounted on side-cars.—*The Illustrated London News.***

# UNITED STATES

## *"Exercise Snowdrop"*

Among the winter exercises held by the Army during the past season was "Exercise Snowdrop," in which elements of the 82d Airborne Division participated with the Air Force's 316th Troop Carrier Group at Pine Camp, New York.

The paratroopers received individual training during the early part of the exercises, with mountain climbing and ski instruction being given by personnel from the Army Winter Warfare and Mountain Training School.

The first phase of the exercises em-

**Paratrooper in "Exercise Snowdrop."**

phasized acclimatization to extremely cold weather. The second phase, which began in December, was devoted to squad and platoon problems, terminating in a mass jump from C-82 packet planes and the establishment of an airhead.—US Army Signal Corps photo.

## *"Exercise Yukon"*

The primary purpose of "Exercise Yukon," held in Alaska, was to develop doctrine, tactics, technique and organization for arctic operations. In addition to performing tactical exercises, the troops tested various types of specialized items of equipment and clothing designed for use in deep snow and frigid weather.—Department of the Army.

## *Research Directive*

The Secretary of Defense has issued a directive defining the powers and duties of the Research and Development Board.

A temporary Research and Development Board existed during the latter stages of World War II, but the present Board was formally established by the National Security (Unification) Act.

The Board is comprised of the chairman and two senior representatives each from the Army, Navy and Air Force. Its powers and duties are as follows:

(1) Make decisions and resolve differences on research and development among the several departments and agencies of the National Military Establishment.

(2) Be responsible for specific research and development programs and the allocation of projects of joint interest; reallocation of responsibility for joint projects.

(3) Establish methods for exchange of information to avoid duplication.

(4) Maintain close coordination with the Joint Chiefs of Staff so that new scientific advances and new weapons may be considered in strategic planning.

(5) Advise the Munitions Board of critical and strategic materials required for various research and development projects.—*Armed Force.*

## *Scientific Assistant*

The Secretary of the Army has decided to select a scientific assistant to the Assistant Secretary of the Army, whose duties will be to insure the proper relationship between scientific effort and planning in the Army, to see that there is effective correlation and mutual support between the Army and other governmental departments, and to see that there is proper contact between the Army and industry and civilian science.—Department of the Army.

### *"Operation Windchill"*

The purpose of "Operation Windchill," held during the early part of this year, was to provide the Army Medical Department, with cooperation from the Air Force, with information on the physical and psychological reactions of troops suddenly transported by air from warm climates to extreme Arctic cold. Thirty-two Air Force soldiers were acclimated to semi-tropical conditions in Florida, and then in less than a day they were landed in an Arctic base where they set up a bivouac.—Department of the Army.

### *Atomic Medicine Course*

Many of the schools of medicine in the United States have sent representatives to the course on medical aspects of atomic explosion at the Army Medical Center, Washington, D.C.

Sponsored by the Armed Forces Special Weapons Project, medical services of the armed forces and the Veterans Administration, the primary purpose of the training program was to portray the various types of injury produced by atomic blast and to outline fundamentals of treatment. Students have been drawn chiefly from the Army, Air Force, Navy, Public Health Service, Veterans Administration and other Federal agencies.

Given once each month since last October, the course was opened in December for the first time to medical school representatives. The February course was the last in the series.

Instructors were specialists in the various phases of radiation and blast injury from the Army, Navy, Public Health Service, Veterans Administration, Atomic Energy Commission and Armed Forces Special Weapons Project.

The course did not take up in detail the technical aspects of radio-activity, but was concerned only with the fundamentals of radiation hazards, diagnosis and treatment.—Department of the Army.

### *Signal Equipment Tests*

In specially constructed climatic test chambers at Fort Monmouth, the Army Signal Corps has been testing Signal equipment under conditions equalling the intensity of storms experienced in Arctic regions.

In order to make the test chambers adaptable to snow making, it is necessary to rid the room of the heat stored in the air, walls and floor. A temperature of 40 degrees below zero is then maintained for the tests by using large ammonia compressors.

Later, live steam at high temperature is injected into the test room, creating moisture in the form of a visible cloud. The cloud cools rapidly to a temperature

**Engineer Inspecting Radio Equipment in Sub-zero Climatic Chamber.**

below the freezing point of water, forming a super-cooled cloud identical to those found in nature.

When the super-cooled cloud reaches a temperature of 5 to 10 degrees above zero, nucleation may be induced by use of dry ice. When the cloud reaches a temperature of near —40 degrees, a crystallizing process begins, forming microscopic snow crystals. On coming into contact with each other, these crystals form snowflakes. Winds carrying the snow particles are produced by a high-speed motor driven propeller.—US Army Signal Corps.

## *Avitruc, All-Metal Glider*

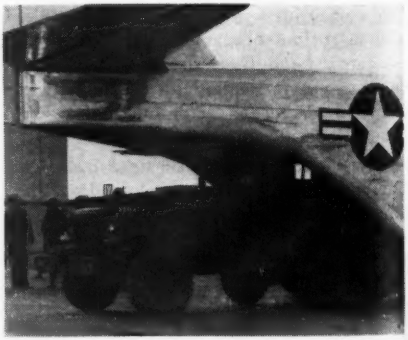
**The Avitruc is the first all-metal glider built in the United States and probably the world's largest.—USAF photo.**

A new all-metal glider which the Army Ground Forces plan to use for carrying troops or cargo has proved both stable and maneuverable in flight tests.

The Avitruc is the first all-metal glider built in the United States, and is probably the largest glider in the world. Its official designation is the CG-18A. Wing measurement is 86 feet, and the fuselage is 53 feet long and 18 feet high.

In the fuselage there is room for 32 soldiers with complete combat equipment, or space for four tons of cargo. A cargo ramp in the rear permits easy loading of a one and one-half ton truck.

A steel tube cage reduces some of the hazards of crash landings for the pilot and co-pilot. Some of the features of the glider are a tricycle landing gear, extremely thin wing for speed, and a low stalling speed to facilitate landing in small areas. It is believed that approximately



**Loading a one and one-half ton truck in the Avitruc—USAF photo.**

80 per cent of the gliders used operationally can be recovered for future use. The glider is manufactured by the Chase Aircraft Company, Inc.—News reports.

## *Developments in Heavy Ordnance*

**Two examples of heavy equipment developed at the Aberdeen Proving Ground of the Ordnance Department. Above, 12-ton 8x8, cargo truck T26 (Sterling), showing unusual steering action. Below, 45-ton semi-trailer T58E1, carrying a heavy tank, coupled to a 12-ton 8x8, truck, T26, on the wave course of the Proving Ground.**

## MISCELLANEOUS NOTES

### *Modern Armory Plans*

To meet the requirements of the expanding National Guard, the Army Corps of Engineers has prepared drawings, specifications and pictures of model armories for distribution to The Adjutants General of the several states. It is estimated that approximately 1,500 new armories will be required to house the increased strength of the National Guard.—Department of the Army.

### *Fort Lesley J. McNair*

The name of the Army War College post at Washington has been changed to Fort Lesley J. McNair, in honor of the former Commanding General of Army Ground Forces who was killed in action in Normandy in 1944.—Department of the Army.

### *Safer Sea Landings*

The Navy is equipping several of its new land-based patrol planes with a hydro-flap, a planing surface that is swung down beneath the fuselage to serve as a hydroplane ski when making forced landings at sea.—*Army and Navy Register.*

### *Scrub Typhus Tests*

The Army Medical Department is planning tests in Malaya this year to determine the effect of chloromycetin in checking scrub typhus.—Department of the Army.

### *General Staff Reduction*

The Department of the Army has issued orders which have the effect of reducing the number of General Staff Directors reporting to the Chief of Staff from six to five. This has been accomplished by redesignating the Research and Development Division of the General Staff as the Research and Development Group of the Service, Supply and Procurement Division of the General Staff.—Department of the Army.

### *Telephones for Jets*

Direct conversation between weather forecasters and pilots of jet planes is now possible by means of a radio-telephone system in the Air Force. The system was devised to meet the problems created by rapid fuel consumption and high speeds of jet planes.—Department of the Air Force.

### *"Super" Naval Vessels*

Radically new types of naval vessels are included in the program proposed to Congress in the current budget. A large flush-deck type aircraft carrier, displacing as much as 60,000 to 80,000 tons, is among the vessels planned. Other improved types include high speed submarines, small special-duty submarines and an anti-submarine ship.—*The New York Times.*

### *Employee Suggestions*

Ideas submitted by civilian employees of the Army and Air Force during 1947 have resulted in initial savings of more than $9,500,000. The two services paid $176,241.68 in cash awards to employees for 4,631 suggestions which were put into effect.—Department of the Army.

### *Distilled Sea Water*

Fresh water of great purity can now be distilled from sea water at a cost of about one-tenth of a cent per gallon. The distilling units were developed for the Army, Navy, and Marine Corps. As much as 165 pounds of water are produced per pound of fuel, as compared with thirty to forty pounds from older types of evaporators. The purity of the water makes it suitable for storage batteries, and it has recently been used for pharmaceutical solutions which require both the highest purity and absolute sterility.—*The New York Times.*

# Command and General Staff Functions

**Translated and Digested by the MILITARY REVIEW from an article by Colonel Gregorio López Muñiz in "Revista de Informaciones" (Argentina) September-October 1947.**

THE study of Command and General Staff functions requires, in our judgment, an analysis of the qualifications which should be possessed by the personnel called upon to fulfill such duties. Therefore, in any systematic study of the problem, an analysis should certainly consider the following:

1. *Commander*: the necessary qualifications of a commander and the role of command in the preparation and execution of operations.

2. *General Staff*: the need and justification for its existence; the qualifications of General Staff personnel, the organization of the General Staff; the attributes and responsibilities of the commander and the General Staff; the relationship between the General Staff and the commander and the relationship between the General Staff and the troops.

## The Commander

The influence of the commander on the organizations within the Armed Forces is extraordinary. Troops are no better than their commander. Time and again history has proved that a certain organization will operate and obtain results differently under different commanders. Units, both large and small, are no better than their commanders.

The qualities which make up the personality of the commander, particularly when he holds the rank of general, become most important in time of war.

The first and most important quality in a commander is character. Character is nothing more than the constant exercise of determination; the habit of always selecting the solution dictated by the correct sense of duty; guiding all action along those lines which are the most unselfish and advantageous for the group; and an eagerness for, and acceptance of, responsibility. Character is the most desirable moral virtue that any person may have.

To Napoleon, the primary requirement of a military man was stability of character. Thousands of men have rendered their efforts unproductive, and others have failed to influence outstandingly the important events of their time, because they lacked stability of character.

Character, which by no means should be confused with a quick temper, should be joined with intelligence, for otherwise it will result in rashness or stubbornness.

Among the intellectual qualifications of great importance to the commander are imagination and common sense.

Imagination, properly guided by good

judgment, and firmly established in an exact and thorough knowledge of the possibilities of the means available, allows the commander to get a clear idea of the development of events, to make the most plausible assumptions, to consider the most probable eventualities, in short, to get a clear picture of the character and development of the approaching action.

A consequence of character is initiative. Initiative is indispensable; it is an attribute of everyday application in modern warfare, when commanders in all echelons must act in unforeseen situations without orders from higher headquarters. Initiative must be directed towards the objectives of the commander, anticipating his wishes, and preparing the solution to subsequent problems.

The exercise of initiative requires great devotion to responsibility, which is one of the main qualifications required in a commander. Unwillingness to assume responsibility on the part of the commander may lose for him many opportunities to gain decisive victory.

It is important that a commander possess a prestige and rank achieved by his own merits, founded upon a solid military background. Experience, by itself, is not enough, nor is theory.

The commander sets an example for his subordinates at all times. He must continuously keep alive his interest in them, praise the good qualities of his troops, and continually keep them in the best trained and physical condition.

### Principal Duties

The principal duties of a commander are threefold: he must display foresight and make decisions, he must command and coordinate, and he must see that his orders are carried out and that their development is supervised.

Whatever the situation, the action taken by a commander, in every action of war, is covered by these three phases: making the decision, preparation of plans, and conduct of the operation.

Making a decision is the most important duty and responsibility of a commander. In fact, it defines the exercise of command. Other matters he can delegate to his immediate subordinates or assistants, but on him alone rests the responsibility of making the decision.

The commander's decision is aimed at establishing the pattern to be followed in whatever action is decided upon to attain his objective. The making of the decision requires on the part of the commander an understanding of all possibilities, careful thought and systematic arrangement and imagination.

The preparation of plans consists of a systematic and orderly arrangement of all details to put the planned operation into effect. During this phase, the chief concern of the commander is coordination of effort, which requires thorough knowledge of the possibilities of the means available to obtain the maximum results from their coordinated employment, and clearness of thought.

In the third phase, the commander directs the operation. This is the essential part of his effort, inasmuch as every decision, regardless of how exact and thoughtful it is, will be doomed to failure if it lacks aggressive execution.

The will to win is the result of combining the following qualities: energy and tenacity; boldness; broadmindedness, sound and calm judgment; and swift and vigorous reactions.

The true commander shows his real worth in action; he becomes part and parcel of the operation itself.

The tactical qualities required of a commander may be summarized as follows; ability to grasp situations quickly, to make prompt decisions, and to adopt simple schemes easy to carry out. He must be careful in making decisions but bold in executing them; must be able to

uphold the decisions once made with energy and tenacity but permitting flexibility in unforeseen situations; and finally he must be capable of maintaining a careful watch over the operation so that he may promptly exploit success.

In conducting the operation in units up to the division, it is necessary that the commander get the "feeling" of the fight. Otherwise, he will be unable to understand or direct it. His decisions would lack a sense of reality and would be likely to produce undue optimism or pessimism.

The moral influence of the commander in combat is highly important. In this respect we have returned to the conditions of earlier times. World War I saw commanders isolated in their headquarters, surrounded by their General Staffs, maps, charts, and telephones. In World War II, the commander maintained close contact with his troops by plane and vehicle, going into the front lines at times to arrive at a decision or give new impetus to an attack.

Such actions by commanders are above reproach, since the results obtained have generally been so good. Nevertheless, high ranking commanders should not needlessly take such risks because of the consequences in case they should become casualties.

Some commanders find that observing the development of battle sharpens their tactical sense. This allows them to make immediate decisions adaptable to the situation and even anticipate what will eventually take place. If such a commander is restricted to his headquarters, he may vacillate. He is what the military lexicon designates as the "field type" commander, who needs to see the action to grasp the tactical situation.

On the other hand, there are other commanders who make decisions rapidly and accurately when working with maps, and are uncertain when they must make decisions on the ground. They are men who see more with their imagination than with their eyes; the terrain tells them nothing.

There are occasions in war when it is possible to have personal observation in the exercise of command. And there are other cases in which, because of the features of the terrain or enemy action, it is necessary to command without observation. For this reason it is necessary to develop in commanders both aspects of this so called "tactical sense."

### The General Staff

A General Staff fulfills a two fold need: (1) To study and prepare for probable wars (study of organization, mobilization, concentrations of forces, preparation of war plans, etc.) and to provide direction at the highest national level; and (2) To relieve commanders of a portion of their duties.

The complex duties of the General Staff, the importance of its actions, and the multiplicity of situations which might be encountered, demand that officers serving on General Staffs possess special ability and qualifications.

The first is the ability to sacrifice their own convictions when the proper occasion arises. It is the duty of the Chief of Staff to submit to his commander, without mental reservation or hesitation, his own personal opinion based on his knowledge of the situation. He should defend his point of view in the light of the reasons which he used in forming his opinion. But from the moment that the commander makes his decision, even though it may be contrary to his own, the Chief of Staff will display all his effort and enthusiasm in developing the commander's decision with the same faith and good will as if it were his own.

The General Staff officer must possess a wide range of technical and tactical knowledge. All his endeavors should be based on foresight and a systematic arrangement of the facts. He must evaluate

clearly the different aspects of the problem to be solved, and reach a proper solution without vacillation.

Most of the time his work is done under pressure, requiring sound and steady judgment, and a calm mind.

He must be quick in conception and in execution, at the same time considering all details. He will not forget that the complicated operation of arms and services will not start functioning until the orders which explain or materialize the decision of the commander have been forwarded and have reached their destination.

The Staff officer must be a man of action, with outstanding physical resistance and endurance.

The constant contact which the General Staff officer must maintain with unit commanders, most of them senior to him, demands from him tactfulness and good manners, constant discretion, skill in gaining good will, and the ability to understand the other person's position.

In activities outside headquarters, which are principally concerned with reconnaissance and liaison, the General Staff officer should display the best qualities of calmness, attentiveness, good judgment, tact, initiative and self denial. His observations should be presented to the commander with honesty, sincerity, veracity, and lack of emotion.

All of these qualifications would be inadequate, however, if the General Staff officer is not inspired with a deep regard for the troops, whose privations and dangers he should share. Only in this manner will he be able to inspire confidence which is an indispensable factor in the successful accomplishment of his difficult duties.

**Boundary Between Command and Staff**

The exact boundary between the functions of the commander and of the General Staff is difficult to determine. There are three main doctrines on this question, the French, the German as exemplified in World War I, and the German as it developed in World War II. And there is a fourth, if we consider the British system, which appears rather obscure and abstract.

In the French doctrine, the General Staff is nothing more than an auxiliary to the commander. Since the General Staff formulates a decision only when invited by the commander, this doctrine fosters anonymity and lack of responsibility.

Up to and including World War I, in the German Army, the General Staff shared the exercise of command with the commander. The General Staff was not an auxiliary, but a co-partner responsible for its own actions. In World War I, the German General Staff enjoyed such a degree of initiative that it not only prepared decisions for the commander but also initiated them, assuming full responsibility. The General Staff also could write out its dissenting opinion from that of the commander, in order to avoid responsibility for the decision of the commander.

This assumption of command functions by the General Staff arose from the fact that the majority of the large units were commanded by princes of royal birth who were commanders in name only. The General Staff was forced to substitute for them since, in the majority of cases, such commanders lacked the professional qualifications to perform their duties and responsibilities properly.

The German doctrine changed toward a more balanced concept after World War I. In World War II, although the concept of collaboration persisted, the General Staff did not meddle in the functions of the commander. This change reflected the lessons learned in World War I, but probably resulted from having more competent commanders. In 1939 out of thirty army corps commanders, twenty-three

were graduates of the War College; and out of forty-two division commanders, twenty-six were also graduates of the same school, notwithstanding that the War College did not operate from 1918 to 1933.

The British doctrine is summarized by General Montgomery when he said it was the function of the commander to issue the orders and of the Staff to see that they were carried out.

If this concept is clear, then the commentaries of General Montgomery in January 1944 are not understood. He claimed then never to have issued written orders since he assumed command of an Army, as he believed all orders should be given orally and in person.

This concept is even less explainable when he said that he had gone through two moments of deep anxiety in his campaigns and that he would be very much interested to know if his General Staff ever knew which those two occasions were.

The author cannot understand what could have been the duties of a General Staff which did not have to issue orders, and which, in addition, was not informed of the critical moments of the commander with whom it worked.

The ideal procedure, and the one which brings maximum results, may be summarized as follows:

With the commander lies the responsibility of creating, deciding and directing. The right of making a decision is exclusively that of the commander.

The functions of the General Staff are to furnish the commander the necessary information on which to base his decisions; to translate his decisions into orders, disseminating them and supervising their execution; to see that the troops are properly trained for their tactical and strategical employment and to provide for their needs, coordinating the services; and to assist the commander in the work which precedes the decision.

### Relationships

Relations between the General Staff of a large unit and the commander should be maintained through the Chief of Staff, In this respect, General Montgomery's opinion is conclusive when he says that the commander that is burdened with all details will fail. The higher his rank the less he should be preoccupied with details. He should be free to concentrate on the vital principles of war on which the final results of the operation depend.

The relationship between the General Staff and the troops falls into two categories—administrative matters and operations orders.

The former should be reduced as much as possible. It is true that the commander, in order to make decisions, must have accurate knowledge of the possibilities of his troops and services. This calls for a certain amount of information from subordinate commanders. The practice of asking for reports should not be abused, however, for a good organization does not rest on the number of reports, but on their accuracy. They should be few, accurate, and concise.

As to operations orders, the Chief of Staff, on drafting an order, should give it a sense of reality, thinking about the moral and psychological environment of the person who will receive and execute it. Operations orders should be all wheat and no chaff.

### Summary

Maximum efficiency of a large unit depends on good organization and proper functioning of its headquarters, and this, in turn, depends on:

(1) An energetic commander, who is bold and calm, and who possesses a fertile imagination capable of quick, sound judgment and the ability to arouse and maintain the will to win in his troops.

(2) An active, methodical and technically proficient General Staff, able to work efficiently with the commander.

# Opposing Forces in China

**Digested by the MILITARY REVIEW from an article by Henry R. Liberman in "The New York Times" 7 January 1948.**

ABOUT 1,250,000 Chinese Government combat troops were committed against 700,000 Communist regulars in the major war areas, north of the Yangtze River, according to the most reliable figures available in Nanking in the early part of 1948.

Although between 4,000,000 and 5,000,000 troops were on the payroll, the Government forces—generally better equipped than the Communists—are credited with an over-all first-line strength of about 2,000,000. The Communists have an estimated regular strength of 1,500,000, including zone of the interior troops.



**Chinese Government Infantry operating in Manchuria.**

The following is a breakdown of the combat strength believed available to both sides in the four main civil war areas:

(1) *Manchuria*—Nine Government armies, consisting of 400,000 men are reported to be operating under General Chen Cheng, Government Chief of Staff, who left his Nanking desk to take over the Mukden Headquarters Command. General Lin Piao, one of the leading Communist strategists, has an attacking force figured at 320,000.

(2) *North China*—General Fu Tso-yi, new Government commander in North China, has an estimated 230,000 men, including about 100,000 of his "own" personally loyal troops. The warlord General Yen Hsi-shan has an additional 200,000 troops in the area of Taiyuan, capital of Shansi Province.

Against this total strength of 430,000 the Communists have two striking forces consisting of 100,000 to 120,000 men. These include between 60,000 and 80,000 under General Nieh Jung-chen who has been active in Hopeh, Chahar and Jehol and 40,000 under General Peng Teh-huai in the north Shensi-Shansi border area.



**Chinese Communist Troops training with captured "Bazookas."—Illustrated London Times.**

(3) *Yellow River Valley*—The Government has an estimated strength in this area of 280,000 men. More than twenty divisions are reported to be operating under General Ku Chu-tung, Government ground force chief who commands the

Lung-Hai Railway line from Kaifeng east to Suchow and also Government forces in Shantung. General Hu Tsung-nan, whose headquarters are at Sian, is credited with about five more divisions.

Communist strength in the Yellow River valley is reckoned at 180,000, split among four striking forces. These include 60,000 under General Chen Yi on the Shantung-Honan-Anhwei border, 40,000 under General Chen Keng in West Honan, 40,000 under General Ho Lung in south Shansi and an additional 40,000 in Shantung.

(4) *Yangtze Valley*—Minister of Defense Pai Chung-hsi, whose Hankow headquarters commands an area running north to the Huai River, has more than ten divisions consisting of at least 140,000 men.

The indications are that the Communists have a total striking power of 80,000 in the Yangtze Valley, including 40,000 under General Liu Po-cheng on the Hupeh-Honan-Anhwei border. General Li Hsien-nien's strength in the lower Han River valley west of Hankow is said to be 20,000, while another 20,000 are believed to be operating under General Wang Fung-ku in the mountains of Hupeh, west of the Peiping-Hankow Railway.

### Government Disadvantages

Despite an over-all numerical superiority of about two to one, the Government's manpower advantage has been offset by the relative immobility of its troops and their dispersal over a vast area. In many places the Government forces are fighting a defensive war against lighter-equipped and more mobile Communists behind such medieval fortifications as city walls and moats.

Within each regional command area a further dissipation of combat strength has resulted from the necessity for guarding long railway lines. This has not kept the Communists from disrupting communications and thus isolating numerous garrisons in a series of coordinated attacks that has kept the Government off balance.

Another complicating factor is a surviving remnant of warlordism in North China. Some delicacy is still required, for example, in "ordering" General Fu Tso-yi to shift some of his troops to Manchuria. Much more difficult to deal with is Yen Hsi-shan, Governor of Shansi, who has kept his troops immobile in the Taiyuan area.

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## Organization of Industry in War

**Digested by the MILITARY REVIEW from an article by Sir Charles N. McLaren in the "Journal of the Royal United Service Institution" (Great Britain) May 1947.**

IN the United Kingdom, from 1919 onwards, we had experience, first of the post-war boom, then of the gradual depression in industry, with a considerable period of industrial strife and unrest, culminating in the General Strike of 1926. The depression continued, spreading to international dimensions until the 1930's when there came a gradual recovery and a slow climb out of the depths. We had then an employment figure in this country of something like eighteen million people, and an unemployment figure of something like two million people, which seemed to have stabilized in that region despite all the devices used by the government for its reduction.

While the general picture of the country's economic prosperity was moderately satisfactory, the national political consciousness was being lulled to a sense of false security by the policy of appeasement which was being pursued.

### Armaments and Technical planning

During this period the armament in-

dustry was stagnant. The only preparations made to maintain the industry were the small amounts of annual requirements for the services, which were cut to a minimum under rigid exchequer control, and the modest department known as the Munitions Technical Planning Department. This body had no power to place orders, even of an educational type; indeed, there were no orders to place. Their job was confined mainly to contacting industry, maintaining records of estimated capacities of various firms in terms of war equipment, and the writing and the keeping alive of Process Manuals of the weapons and ammunition which would be called for at the earliest stages of any expansion.

### Royal Ordnance Factories

In dealing with the subject, I shall sometimes with intent refer to or be influenced by my position as Director-General of Ordnance Factories. This organization employed at its peak some 350,000 workers engaged in engineering factories, explosive factories and filling factories, and can be regarded as giving a very adequate cross-section of British industry. Its troubles, and these were many, were undoubtedly endemic throughout British industry.

### Rearmament

The year 1936 may be regarded as the commencement of rearmament; and this expansion took the threefold form of the building up of new Royal Ordnance Factories and Dockyards, of the provision of shadow factories for the aircraft industry, and of the increase of activity of the Industrial Planning Department involving the placing of educational orders with industrial firms so that they could have actual experience in the manufacture of armaments.

### State Factories

To deal with these separately, I would first of all talk about Royal Ordnance Factories. Of these, only three were in active operation—Woolwich Arsenal, the Royal Gunpowder Factory at Waltham and the Royal Small Arms Factory at Enfield. There had also been in cold storage three other factories—a filling factory at Hereford, an explosives factory at Irvine, and a cartridge case factory at Birtley. The number of people employed was about 9,000.

The first decision was the removal of the filling factory from Woolwich Arsenal and its replacement by two factories spread over the country. The sites of these were eventually located at Chorley in Lancashire, and Bridgend in South Wales.

A factory for the manufacture of high explosives was approved, and this was built at Bishopton in Scotland. On the engineering side, a factory was approved for the manufacture of medium caliber guns, and a factory was purchased which eventually became the Royal Ordnance Factory, Nottingham. By the beginning of the War in September 1939, there were altogether fourteen factories either in production or being erected.

On the naval side, the time of rearmament was very actively spent in modernizing and expanding the dockyards and in laying down new plants, in so far as requirements could be forecast.

On the Air Ministry side, the industrial plant was generally not suitable, and the areas available not sufficient for meeting an expanded program of aircraft manufacture; and the method of expansion was the starting up of shadow factories under well known manufacturing groups, particularly in the motor car industry. The basic technique of this manufacture, of vast production layouts and belt assemblies, was the very pattern on which an aircraft industry in war would have to be built, and the many shadow factories which were erected and were at that time the subject of much criticism proved to be an invaluable investment and worked extremely well later.

### Industrial Planning

On the industrial planning side, the work which had already been put into this in the way of preparation of Process Manuals and the gathering together of information regarding the capacities of engineering firms was brought to practical issue by the placing of experimental orders for various items of armaments, weapons and ammunition with various firms; and their instruction in the manufacturing process began. This gave the opportunity of proving existing types of production machinery, and of improving, developing and re-designing where possible, so that specialist machines for specialist jobs replaced the general purpose machinery which had been the order of things in World War I.

At this time too, there was commenced the process of assisted schemes whereby Government-purchased plant was installed in firms' works against the probable requirements and to meet the capacity of the rearmament program. This two-fold method of expansion was instituted by the War Office. The Ministry of Supply was set up later.

This period of rearmament was very valuable, as it enabled us to commence the War at a much higher level of manufacturing capacity than would have been the case had we been caught quite unprepared. The expansion scheme which had already been carried out gave us a valuable blueprint from which to work in the more rapid and greater expansion which was required as soon as war commenced.

In the Royal Ordnance Factories from 1936 to 1939, the employment figure had risen from 9,000 to about 36,000. It went on to reach 350,000, spread over forty-four factories.

### Labor Supply and Trade Unions

With the start of the war in September 1939, the fundamental problem was the harnessing of the nation's manpower and womanpower to the needs of the fighting services and of the war industries.

Industry immediately suffered from the loss of young and able-bodied men due to mobilization of Territorials and enlistment of volunteers. To counter this it was necessary to recruit new labor; and it was essential that new labor should be trained.

This involved negotiations with the trade unions on the preservation of the rights and conditions applying particularly to the skilled trades, and an agreement was reached generally on the relaxation of trade customs for skilled men. By this means, it was possible to bring in men who had been trained either by the Ministry of Labor under their training schemes or by training schemes at individual factories, or by promoting men who had had experience in the factories. These people could be nominated to the trade unions for classification as skilled men and, subject to the agreement of the union, could be so regarded for the period of the war or until such time as reduction in strength took place, when such people would go first. It also applied to the training of women and the placing of them on skilled work. In these cases, apart from the nomination of the worker and the maintenance of a register of such workers, there was a classification of skilled work on which such operators could be employed.

Thus we had great assistance from the trade union movement in reaching agreements, which would enable us to build up manpower in the industry and yet to maintain such safeguards as were the right and prerogative of the union when the period of emergency should be over. These conditions were, in general, faithfully observed on both sides, and the whole scheme of relaxation of trade customs and the dilution of skilled men was carried out with amazing success, due very largely to the excellent cooperation that existed between the trade unions and the government and employing bodies.

There also followed the setting up of wage agreements in industries where women had not formerly been employed. All this very necessary work was carried out in the early days of the war, and the basis of agreement reached, except for adjustments from time to time as wage levels altered, remained in force practically throughout the war.

Following this came the necessity for training new workers. This was done by the Ministry of Labor and National Service and also by individual factories according to their requirements, availability of labor, and speed of getting into action. It was quite impossible that the whole of the trained workers should come from the Ministry of Labor training schemes, and so all schemes were pressed into force.

In the meantime, hours of work had been extended. It was realized that there were 168 hours in the week, and the call was for the maximum number of hours of production out of the possible 168. This call came from the necessity for making the fullest use of manpower and available plant. Double shifts and treble shifts were introduced at once. In the case of double shifts, it meant twelve hours a day with shifts joining and working until 7 or 8 p.m. on Saturday. By working in this way, hours of something like sixty-six per week were possible on day and night shifts, and the resulting 130-135 hours per week were regarded as the optimum on a two-shift basis. On a three-shift basis, eight-hour shifts were, of course, the rule, and these were generally arranged to give nineteen shifts per week or 152 hours. This was a considerable advance in plant utilization over the two-shift method, but involved a greater use of manpower. The shortage of skilled men was such that in the industries where much reliance was placed on the skilled men, they were forced to adopt the two-shift system to make their skilled workers spread out as far as possible.

### National Service Acts

Following upon this, in 1942, came the National Service Acts and the Essential Works Order, involving the full direction of labor. This was one of the greatest single far-reaching pieces of legislation passed during the war. While it had a distasteful and unpopular function to perform, nevertheless it provided the true basis of labor supply and direction for the remainder of the war.

There was established a measure of security by the adequate provision of appeal facilities against unjust decisions of direction or of subsequent employment, so that the act continued to be not only necessary but universally successful in fulfilling its fundamental objectives.

### Joint Consultative and Advisory Committee

The many types of labor involved the bringing together of all classes into neighborhoods which in many cases were not industrially minded, and created problems for the control and regularization of the workers and their interests which exceeded anything that industry had hitherto experienced. Moreover, the call of the workers for a greater share in the policies and production schemes being followed in the winning of their war made it certain that some improved method of labor relationship would have to be found.

The need for broadening the basis of industrial relationship and for giving the workers a fuller chance of the expression of their own desires in the matter of production and putting forward their ideas for improved methods of production became clamant, and so the instrument of Joint Production Committees was forged. This consisted of joint consultative and advisory committees, consisting of equal numbers of workers and management staff, to advise on production methods and matters and any improvement in regard thereto. These com-

mittees were first established in the Royal Ordnance Factories based on a constitution agreed between the Ministry of Supply and the trade unions; but industry very soon followed with a similar constitution and the idea of Joint Production Committees quickly spread and became a general feature of industrial procedure.

### Wages and Earnings

The wage structure of the country has not undergone any particular changes through the war. Methods of payment are still either straight day work or straight piece work or various methods of bonus payment. These are as various almost as there are types and variety of industry. Earnings in themselves have, of course, increased very considerably.

At the beginning of the war, the average payment of a skilled man was about forty-six shillings on straight day work, and this was increased by various supplements in the way of war bonus or industrial bonus, a large proportion of which was eventually consolidated into the basic rate, and the general standard in industry for a skilled man became sixty-nine shillings per week of forty-seven hours. Piece work balances or bonus payment systems of one sort or another increased these earnings by as much as 100 to 200 per cent—sometimes even more. This, together with additional hours and payment for overtime, etc., has led to earnings which are often quoted as excessive. But earnings quoted are often misleading, in that they are not related to the number of hours put in or to the exceptional zeal and energy which some workers put into their tasks. Moreover, it must be remembered that many prices were fixed on peace-time standards, and the much longer runs of work which were available under wartime conditions enabled workers to earn more. Nevertheless, it is true that earnings were influenced by the law of supply and demand. As labor was scarce—skilled labor in particular—there was naturally competition among industries for the best labor and, despite the Essential Works Order (direction of labor) and other devices for regulating employment, the firms paying the highest rates were most successful.

### Contracts

The system of government contracts and methods of payment was in general one of cost plus profit with the important provision that the cost was an ascertained cost arrived at in conjunction with Government cost accountants. In the late war, a much greater degree of control was exercised and the work of cost investigators for the government departments tended to moderate costs and prevent large profits. The lessons of World War I were, in this respect, well learned by the Government Contracts Departments.

### Controls and Priorities

It is remarkable to reflect on the extent to which controls became necessary and were applied. The principal control as far as war industry was concerned, was the Iron and Steel Control, the body through which all supplies of steel were regulated. It insured that all steel available, either from manufacture in this country or from importation, was allocated in accordance with pre-determined requirements based on phased production schedules, and it insured that the most urgent needs had the first call on available supplies.

### Organization

It is also important to look at the organization of industry from the national point of view. Provision had been made for the control and allocation of material supplies. The question of distribution of supplies raised the important question of Regional Organization.

It was evident from early in the war

that however essential centralization might be to obtain a global view of industry and its requirements it would be difficult, if not impossible, to handle all problems from London, which was in constant danger of interruption from enemy action. It was therefore imperative that some degree of decentralization should be achieved, and this was done on a regional basis.

There were eleven regions, each in charge of a regional commissioner who was empowered in emergency, such as invasion, to assume complete control. In addition, the various Ministries appointed regional controllers and these, together with the regional commissioners, formed Boards capable of examining and discussing and assessing industry in all its aspects within the regions, down to the capacity of local garages and workshops, and of complete coordination between themselves and with their respective authorities at Headquarters.

### Expansion of Manufacturing Capacity

On the physical side of the expansion of war industry many difficulties had to be overcome. There was first and foremost the shortage of materials for construction.

First, timber. There were vital requirements from the services for timber for building camps, hutments at home and in France. There were Ministry of Supply and Ministry of Aircraft Production requirements for building of factories. There were also Home Office requirements for building of shelters, strengthening of cellars and the like as air raid precautions. There was also still a certain amount of civil demand for completion of building projects already started. All these clashing requirements resulted in the formation of the Timber Control, from whom licenses had to be obtained for any timber required. This did not produce any more timber, but gave definite allocations against approved programs of construction.

The next shortage was steel, and structural steel went the same way as timber, with the result that all sorts of devices were brought into being for the saving of steel in building work, and the extraordinary increase in the use of bricks and mortar and concrete sent these into short supply in their turn.

Despite these shortages, a great deal of building construction took place in the first year of the war. It was no uncommon feat with the Royal Ordnance Factories to have construction so speeded up that it was possible to begin to run machines within five months of breaking ground.

### Machine Tools

The speed of construction only emphasized in its turn the shortage of equipment, particularly of machine tools. The machine tool industry of this country was quite inadequate to meet the needs of the expanding war service, and large orders for machine tools were placed in America. In this respect, the engineering industry experienced the first and foremost advantage of President Roosevelt's Lend-Lease scheme. Even so, the shortage of machine tools was serious, and in 1940, this shortage was so grave that a nation-wide census was undertaken to ascertain the use of existing machine tools. From this, a statistical analysis of utilization was made, and steps were taken to transfer those machine tools which were not working up to a defined time standard. At this time, it is true to say that the bottleneck of production lay in the shortage of machine tools. The shortage of labor had not become acute, and it was considered much more profitable to work the machines for three shifts, absorbing additional people, rather than have them standing idle for a break in a two-shift system. The figure of merit

for industrial performance at that time was the number of hours of production being obtained from the machine tools.

### Jigs, Tools and Fixtures

The shortage of machine tool capacity was almost shadowed in its later phases by the shortage of jig and tool capacity. In the introduction of so much green labor into industrial fields, in the loss of skilled men to the forces and the consequent lowering of the standards of skill, it became more and more essential to break down manufacturing processes into as many simple operations as possible. This policy threw a tremendous load on to jig and tool and gauge capacity, and toolroom schedules became greatly overloaded.

### Expansion Schemes and Capital Assistance

The expansion of production was obtained in many ways and by every possible means, but generally within the following four categories:—

(a) Expansion and building of state factories and dockyards.

(b) The turning over of redundant or luxury industries to war production.

(c) Expansion of privately-owned factories by means of Government-assisted schemes, or by the setting up of agency factories.

(d) By extensive sub-contracting.

These general classifications were pursued as circumstances and time dictated and a large measure of flexibility was retained so that maximum use could be made of existing plant or organizations.

If a decision as to whether a given expansion should be undertaken by State factories or private industry was in favor of the latter, Government capital could be used to expand existing capacity if this were needed. Such schemes could be initiated by firms individually or suggested and sponsored by the interested production department.

### Group Working

Another development of war production was generally described as rationalized production. That is to say, instead of employing factories or firms in making machines to complicated designs, it was considered better to form groups of manufacturers and divide the weapon or machine into various components, each of which would be undertaken by one firm. In this way a great economy in the use of jigs and tools was made, a simpler manufacturing problem given to each of the firms and the resulting production both in time and quantity considerably improved. The formation of these groups, consisting in many cases of firms who were rival manufacturers in peace time, was one of the engineering triumphs of the war.

### Mass Production

It is an axiom of engineering production that repetitive orders and long runs are the only way in which to achieve the highest efficiency. As far as possible, this aim was kept to the fore, and in such matters as shell, cartridge cases, ammunition and the like, while minor changes were introduced, in general repetitive work enabled production to be obtained at a high level of efficiency. While the object remained the same over weapons, the changing course of the war touched on strategical requirements, and the inherent advance in design tended to cause modifications and changes in the program. These had to be expected as part of the manufacturers' problems.

### American Practice

It might be as well to pause and consider this war expansion in relation to the expansion of our later Allies, the Americans.

The Americans have always been noted for genius in mass production, and it

is true to say that first of all in Lend-Lease and later when America joined in the war, the evidence of her mass production methods and the success of her industry was apparent not only in machine tools and engineering tools but also in the greater field of transport and of air warfare. Apart from this, her contribution to shipbuilding was not inconsiderable. It is safe to say however, that the additional time which America had in preparation for the war gave her time to develop and expand her industries according to her own methods.

These methods are to design and plan a scheme to the last degree, equipping all plants with jigs and tools and fixtures, scheduling the last movement and sequence of the components, planning the whole production down to the last stage of assembly, and having everything on the job before any production labor whatever is introduced. This is ambitious and is a goal to which many British engineers have from time to time striven, but in war industry this was never possible.

When, after Dunkirk, we lost almost all the weapons which had been made in the first year of war, we were urged to fresh endeavors and our plant, which was on the increase, was able to proceed with fullest advantage. If we had been planning on American lines, we might have achieved greater results at a later stage, but we certainly could not have been in the position to have proceeded forthwith to high level production by the means which we had at our own disposal. While the American plan might be considered the ideal plan for ultimate high production, the improvisation for which we nationally have a genius has undoubtedly an advantage when the earliest production must be secured together with the maximum flexibility of the plant to face an unknown future of production.

In America, the rhythm of the plant is so arranged that each worker falls into place to perform his own function at the allotted speed laid down for the whole production line. In Britain, we depend more on the attitude of the man towards his job and the incentive that we offer by means of our various schemes of piece work or bonus payment to do the maximum to maintain production in line with requirements.

Here, again, the American method may be considered to be superior, but is only possible where a long-term program of sufficient magnitude is already assured to make economical the large outlay required of jigs, tools, fixtures and equipment necessary to carry out a time-scheduled mass production scheme. While the American plan has much to commend it, it would not have been possible either in the sphere of land, water or aerial warfare for us to have followed that pattern in the circumstances in which we found ourselves and, therefore, our own method of first of all improvisation followed by the establishment of mass production lines with products rationalized between various firms to the best possible degree is the only possible way by which expansion could have been secured in time to meet the requirements of our armed forces.

It is admitted that only by the heroic efforts on the part of staff and workers were the results achieved from such partial planning as the time enabled us to put into our scheme. Nevertheless, it can be repeated that the extent of our achievement bears undoubted witness to the soundness of the planning and execution of our industry as a whole.

# Swiss Psychological Service

**Translated and Digested by the MILITARY REVIEW from an article by Captain H. Spreng in "Allgemeine Schweizerische Militarzeitung" (Switzerland) June 1947.**

IT is not my intention to deal with what the Psychological Service (WPD) did in the Swiss Army during the period of active service, but with what it may be able to do in the future. The psychological problems involved may be divided into the following: suitability; training and education; the nation and the army.

### Problems of Suitability

Suitability of instructors must be placed first. We cannot be too careful in the selection of our few, permanent officers. The argument is often advanced that aspirants to instructional positions are so well known by their superiors, from the standpoint of intelligence and personality, that a psychological test to ascertain their suitability is superfluous. This contention is often disproved by the fact that instructional officers are appointed who later fail to prove entirely satisfactory as military instructors.

In an army made up of militia, the suitability of recruits for their tasks must be given maximum consideration. Therefore it is necessary that draft and recruiting organizations be assisted not only by physicians but also by psychologists. The question should also be examined again whether the pedagogical portion of the recruit examination should not be arranged more in the form of a collective suitability test.

The Swiss Army is more and more made up of specialists. At the beginning, and again during the second half of the recruit school courses, specialists are selected in a much too slipshod manner without sufficient regard for personal suitability, lack of it, or personal inclinations.

The selection of noncommissioned officers is an important matter and should be checked by psychologists in questionable cases. We find here the same problems found in industries. In both cases there is great danger that persons with a false "front" and others with unsuitable personalities will be recommended for advancement.

In the case of officers, a very careful test is necessary for ascertaining the degree of suitability. Anyone at all conversant with this problem will have no doubts as to the valuable services rendered by psychology in tests for fitness for leadership.

The importance of proper qualifications in the case of unit commanders parallels that in the case of the instructional officer. Though in active service a regimental commander easily acquires a sufficiently intimate knowledge of the personality of candidates for the position of unit commanders, he will have difficulty during a short instructional period in forming a satisfactory opinion as to which candidates to recommend. The great importance of properly qualified unit commanders in the development of a capable and ready unit is today universally recognized.

### Training and Education

Even in training and education we must logically first mention the training and education of instructional officers. Good instructors have always given great attention to military training. But to our knowledge, not even a two-hour lecture on the practical psychological problems of suitability, tests therefor, qualifications, systematic methods of instruction, etc., have ever found a place in our curricula. But this training is extremely necessary since the young instructional officer constantly has such problems to solve in the discharge of his daily task.

The problems mentioned above should be likewise dealt with in an abridged form as a special subject in the central schools for future unit commanders.

The shorter the training period the more systematic must be the training in handling and use of weapons and other military equipment. Applied psychology has gathered a great deal of information in this field in the last twenty years in the industries. It has been proved that better results are acquired, and in much shorter time, with psychologically sound teaching methods. It would therefore be well, particularly in these days of abbreviated budgets, if we took advantage of this information.

The compilation of regulations and manuals is one of the problems connected with military training and education. These should not only be factually and technically to the point, but also psychologically correct.

### The Nation and the Army

The problems which have been dealt with briefly in this article are largely psychological problems of an individual nature. We are sufficiently aware, however, that a nation's will to resist and defend itself is a problem which belongs to the field of mass psychology. Therefore, it seems obvious that a military psychological service should also deal with these problems. Other service agencies, such as the press and the radio, collaborate in the elaboration and eventual accomplishment of these missions. Without doubt, valuable work was accomplished in this field by the Army and Home Section during the period of active service.

Spiritual mobilization and defense, as well as material, requires continual and careful preparation, and in itself would justify the reorganization of the military psychological service.

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## Turkey Today

**Digested by the MILITARY REVIEW from an article by Lieutenant J. Raeder in "The Army Quarterly" (Great Britain) October 1947.**

PRESIDENT Truman's speech, in which he asked Congress to authorize 100,000,000 pounds sterling for Greece and Turkey to enable them to resist "attempted subjugation by armed minorities or by outside pressure," has once again focused the eyes of the world on Turkey, the country that holds the key to and constitutes the only single barrier between Russia proper and the eastern Mediterranean.

Since the end of the war Turkey has been under continuous though varying Russian pressure. As in the past, one of Russia's primary objects is to gain control over the Dardanelles and Bosphorus. Nor are these aspirations so unreasonable when viewed in the light of events. The Turks would undoubtedly have welcomed the defeat of Russia by Germany, and during the war they certainly permitted the passage of minor Axis warships into the Black Sea.

The Turkish attitude has been conciliatory in that Ankara has recognized the necessity for a revision of the Montreux Convention, but will not go so far as even to consider the Moscow proposal for Soviet bases and "joint" control.

### Russian Claims

In December 1945 Russian tactics changed and she switched her attention to the strategically important and comparatively rich areas of northeastern Turkey. An article written by two profes-

sors of the Soviet Republic of Georgia was given great prominence and reproduced in a number of Russian newspapers. This article alleged that Georgia, a small Soviet republic on Turkey's northeastern border, facing the Black Sea in the west and the other two Soviet republics of Azerbaijan and Armenia in the east and southeast, did not include all the territory that naturally belonged to it. It demanded the cession to Georgia (i.e. to Russia) of some 180 miles of Turkish territory along the Black Sea to beyond Trabzon, from there south to include Gümüsane and thence eastward including Baypurt, Ispir, Olta, the communication center of Kars and the rich Ardahan district up to the point where the boundaries of Turkey meet those of Soviet Georgia and Armenia. In support of these claims Greek, Roman and Byzantine historians were quoted to show that many centuries ago the territory had been Georgian.

It is interesting to note that these areas (the Vilayets of Kars, Ardahan and Artvin) comprise the only remaining parts of the later Czarist Empire not yet recovered by the Soviet Union. However, there is no reason to believe that Russia is claiming these regions solely on historical grounds, for their nearness to the important oil center of Batum might be considered a potential threat by a security-conscious Moscow. American aid to Turkey will hardly tend to allay such suspicions and misgivings.

### Turkish Defense

All these demands have been violently opposed by Ankara, and there is no doubt that, should the necessity arise, the Turks would defend their soil, in the reawakened pride and romanticism of a military nation, no matter how great the odds.

Today the Turkish army is still fully mobilized and has at least half a million men under arms, a tremendous burden on the national economy.

The fortifications on the Turko-Russian frontier are believed to be considerable and the defense is greatly favored by the mountainous character of this territory. However, the rivers and the very few roads and tracks follow the valleys, which all run from east to west. The whole area—i.e. the districts coveted by Soviet Georgia—can be militarily and geographically divided into two: the narrow strip bordering the Black Sea; and the interior, which rises steeply from the coast, forming a comparatively barren and mountainous plateau which has a typical inland climate of hot, dry summers and cold winters. Within this area there are only two really serviceable roads, one at each end. The coastal and northern road could be easily shelled by Black Sea naval units, while the one on the east is so close to the Russian frontier that it would be of doubtful value in case of war with the U.S.S.R.

In the southeastern part of the disputed territory lies the strategically important town and fortress of Kars. It is the center of a comparatively good network of roads, one of which, together with a railway line, leads back into the interior. The whole region, and with it the coastal strip, could be fairly easily defended if attacked solely by forces advancing from the Soviet border. But there is one serious disadvantage: in spite of the extreme steepness of the coast, which is frequently cliffed and backed by wooded mountains, there are many places where amphibious landings could be carried out, and today such an operation would meet with little resistance from the sea or air, due to the smallness of the Turkish navy and air force.

### Few Harbors

Admittedly an amphibious landing on the open and exposed Turkish Black Sea coast would be no simple matter, for there are very few natural harbors. The only safe roadstead between the Bosphorus

and Batum is Sinop, which hardly possesses any communications with the interior. Samsun, to the east of Sinop, is better off in that respect and is connected by paved roads with Sivas and Kayseri, but the port is very exposed to wind and weather, which make landings in winter often impossible; while owing to the shallow, tideless water, ships have to lie as much as a mile offshore.

Without outside aid—i.e. from the British and/or American navies and aerial forces—the long coastal strip would appear to be indefensible against a concentrated combined land, sea and air attack. A successful landing would in turn cut off all Turkish troops defending the frontier.

### Foreign Relations

Meanwhile Turkey is allied to Iran and has a common frontier in Iran-Azerbaijan. The alliance is, however, of somewhat doubtful value owing to the political and economic instability of Iran. If Azerbaijan should succeed in its struggle for autonomy under Russian "protection," the armies of Turkey and Iran would automatically be separated.

Of late Turkey has shown considerable interest in establishing better relations and closer cooperation with the Arab countries. Yet both in Syria and in Lebanon her advances have been received with reserve and traditional suspicion, which in Syria's case has not altogether been allayed with fear in spite of her President's state visit to Ankara some months ago. Nor has Syria quite got over the loss of Hatay (Alexandretta and Antioch), of which Moscow's Arabic propaganda broadcasts constantly remind her. The Turks in turn view with growing disquietude Syria's leftish tendencies and her increasing economic dependency on Russia.

The role that the Turkish nation will play in the future of the Near and Middle East will greately depend on the Turkish army and on the progress of the country's ambitious industrial program. In developing both of these, American financial, technical and military aid will obviously have a very important and beneficial effect.

### Role of the Army

Today, as in the past, a great deal depends on the Turkish regular army officer. Turkey is and has always been a military nation, ruled and governed by military men. To the average Turk it would, for example, be inconceivable for the nation's leader—the President—not to be an officer. There are today in Turkey two distinct classes of people as regards mentality and outlook, especially among the officers. On the one hand there is the older and higher ranking officer, whose training and education were greatly influenced by Germany. On the other there is the young officer who grew up in the atmosphere and spirit of Atatürk's revolution—the "rebirth of Turkey."

The present-day young Turkish officer is smart, alert and physically fit. He receives a comparatively modern and thorough general and military education. Yet no matter how outstanding his ability and personal qualities, he will never reach a rank or position where he can influence the army's leadership and policy until the older generation above him retires or dies.

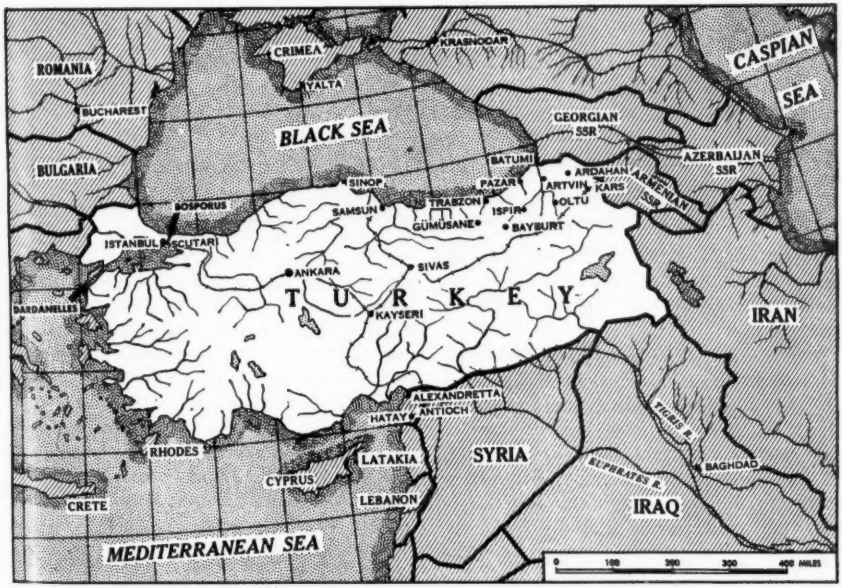
Of the rank and file of the Turkish army, 85 per cent are still illiterate in spite of the great progress made in education during the last twenty years. It is only natural therefore that the average soldier has little or no understanding of the technical side of modern warfare, though he is still the same tough, dogged and brave fighter.

### Present Equipment

During World War II Turkey received large quantities of war material from

Germany, Britain and the United States, with the result that today she possesses an amazing and disturbing variety of arms and equipment. For example, her various pieces of artillery originate from Germany, France, Czechoslovakia, Russia, America and Great Britain, and even her small arms are not standardized.

During the course of the late war, and particularly the latter part of it, Turkey greatly profited from American Lend-Lease and from a steady stream of British supplies. This Anglo-American aid also took the form of instructors and technicians, and of senior officers who were attached to the Turkish army in an advisory capacity. New harbors and airfields were constructed as well as roads, radar and weather-reporting installations, etc. In spite of all this, much remains to be done. If President Truman's proposals are accepted by Congress and put into force, the Lend-Lease aid, from which Turkey and numerous other countries so greatly benefited during the war, will in a sense resume its flow. The importance of these supplies cannot be overemphasized, for, technically at least, the Turkish army is still in its infancy. It is mainly horse-drawn and the problem is not so much to obtain mechanized vehicles as to train the personnel in their care and maintenance, as well as to construct roads, workshops, etc. The Supply and Ordnance branches of the army are quite undeveloped judged by modern standards, and the atmosphere of "living on the land"—of depending on local resources for provisions and other necessities—still prevails; while the administrative services are bureaucratic and strangled by red tape.




## Current Situation

With ruthless genius, in twenty years Kemâl Atatürk jolted Turkey two hun-

dred years forward. His successor, Ismet Inönü, is in addition, and in contrast to Atatürk, a Conservative and Moslem. With Atatürk's death the momentum has slowed and the reformist spirit dried up. Elections in Turkey are hardly different than in many Russian-dominated countries. The opposition is carefully controlled, as is also the press, and rebellious, outspoken journalists and editors are frequently jailed. The Greek, Armenian and Jewish minorities are persecuted in various ways; they are excluded from political life and during the war they were conscripted into special non-combatant labor battalions. Until a few months ago it was possible to avoid the greater part of one's military service by paying a special "tax."

Turkey has come a long way since Kemâl Atatürk founded the Republic in 1923, but she has still far to go. It is to be hoped that social reforms may be crowned by the unfolding of ideological and political freedom and that Turkey will prove herself worthy of that support from the democratic West upon which her fate and future so greatly depend.

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# Soviet Strategy and Deep Penetrations

**Translated and Digested by the MILITARY REVIEW from an article by General A. Niessel in "Revue de Defense Nationale" (France) August 1947.**

WHEN, in June 1941, the Reich attacked the USSR, the Germans expected once again to wage a Blitz war as in Poland and France.

The Germans were numerically inferior to the Russians but their troops were of the highest quality and perfectly equipped. They inflicted heavy losses on the Soviets, but the immense reserves of manpower of the latter permitted them easily to fill the gaps with elements of the same value, while little by little, the quality of the German troops deteriorated.

Moreover, Soviet strategy from the beginning was based on echelonment in depth while the strategy of Blitz warfare consisted, mainly, of a powerful penetrating element in which use was made of the major part of the forces. This permitted the Germans to sweep everything before them in 1941, but their deep advances in divergent directions led to broad extensions of the front. The Soviet armies dropped back to echelons made up of reserves brought up from the rear into zones chosen in advance, while at the same time conducting an active defense in which armor played a large part. Russian resistance, therefore, continued to increase, while the offensive possibilities of the Germans diminished.

Although powerfully assisted by aviation and armor, the Germans progressed less rapidly than had Napoleon in 1812. They did not succeed in disorganizing the front and always found reserves ready for combat facing them instead of exhausted elements. They had failed to conduct a Blitz operation.

### Strategic Offensive

The Russians waited for the propitious moment to assume a strategic offensive. This took place first at Moscow. The Germans had engaged there three armored and two normal armies: fifty-one divisions, thirteen armored, five motorized, and thirty-three infantry, supported by powerful aviation.

While the defense west of Moscow continued to stiffen, the Germans succeeded in making some progress on their flanks. Their left reached Dmitrovo north of

Moscow, while in the south the tanks of General Guderian circled around Toula. The Germans desired to push from three directions against the capital, but found themselves powerless to carry out this plan.

These attacks had already cost the Germans dearly when on 6 December the army group under General Joukov, having received very heavy reinforcements, passed over to the offensive, supported by powerful aviation and artillery which was numerically superior. The main German formation, caught in the flank, was obliged to draw back; large portions of it were annihilated. The German withdrawal in certain directions exceeded 200 kilometers.

In these operations, Soviet cavalry corps followed and supported the action of Soviet armor and followed close on the heals of the retreating Germans. This victory proved that the Germans were not invincible and that it was possible to seize from them the initiative in operations. During the winter of 1941-1942, operations were generally in favor of the Soviets.

"The strategy of deep echelonments," wrote Major General Isaev, "ruled in the colossal strategic operations of 1942-1945. Conducted by combinations of several groups of armies disposed in multiple echelonment, they permitted several advances of from 400 to 500 kilometers in twenty days. From the moment the main body of Soviet forces were mobilized, the Germans were no longer able to exceed the limits of a single strategic operation: Stalingrad in 1942, Kursk in 1943. In addition, these ended as catastrophes for them. The nature of the Soviet offensive operations was different. They did not consist in the action of a single army or a single group of armies. They were often bound together by a single strategic concept, common to several groups of armies and developed on fronts of immense breadth and depth."

### Numerical Superiority

According to General Martel of the British army, the Soviet troops always enjoyed numerical superiority. In the summer of 1943, this superiority passed from double to triple, and at the end of 1944 from triple to quadruple. While at first they lacked motorized infantry formations, the Russians were able later to create many of them, thanks to the abundant supply of American trucks. They also knew how to make skillful use of masses of cavalry along with the motorized forces of all branches of the service in the support of deep penetrations.

Although recognizing the great role played by aviation and armor, many Soviet generals have affirmed that the infantry always played a leading role in success and that all of the other arms should operate in such a way as to render its task easier. The fact is frequently mentioned in the Soviet military press that the infantry must make use of all its weapons, with no exceptions, great importance being attached to the rapidity and accuracy of rifle fire. One often finds, in Soviet military literature, the expression, "all-arms commander" employed under conditions indicating that large quantities of artillery are placed *under the direct orders* of infantry officers of no high rank, when the two arms are to act in close cooperation.

### Army Groups

Two, three or four Soviet armies were joined into army groups. There were eleven army groups. When several army groups joined in a single operation, they were, as a rule, placed under the orders of a single commander. In each group of armies, all the air formations were under the command of a single aviation commander who was subordinate, him-

self, to the commander of the group of armies.

The High Soviet Command, as soon as it had seized the initiative, did not content itself with tactical successes. It chose operations which insured strategic results. This required employment of deep penetrations which became a rule, thanks to the close coordination of all arms which were deeply echeloned to provide repeated efforts. The main blow was directed against a zone which would permit a break in the enemy's front. Simultaneously, there was often a secondary attack whose purpose was to attract the reserves to another point. At other times, when considerable forces were available, multiple attacks were conducted at intervals which permitted them later to join together in such a way as to crush the enemy defense over a broad front.

These offensives required intense and sustained efforts, for the Germans organized numerous successive zones of defense several kilometers in depth, each consisting of several lines of trenches, centers of resistance, and organization of inhabited places.

### Attack Fronts

The breadth of attack fronts varied with the available sources, the strength of the enemy, and the strength of the latter's positions. A narrow attack front permits echelonment in depth and repeated efforts, but it carries with it the risk of having to meet counterattacks from the flank. If these counterattacks are repelled, the corridor is widened and permits the continuation of the penetration. Frequently, the attack front was only fifteen to twenty kilometers broad.

Following the elements making the penetration of the principal position, came armored formations, motorized elements, or masses of cavalry, while succeeding echelons attempted to broaden the penetration. The general objective was to encircle large forces of the enemy by means of the combined penetrations or, in the case of a single penetration, to beat the enemy in its retreat toward a water barrier, permitting other forces to complete his encirclement.

Execution of the penetration comprised the following phases: preparation; the attack and penetration of the main defense position; the battle in the tactical zone of the defense; and exploitation of the penetration.

The preparation was in great detail. It was based on a complete study of the enemy situation based on air and ground reconnaissance, and included the calculation of forces necessary, especially artillery, organization of observation and liaison, lateral and in depth; the assembly zone and zone from which the attack is launched; plan of action; study of itineraries; and the tactical and technical preparation of the personnel involved. Several days at least, sometimes several weeks, were devoted to it.

### Soviet Artillery

Soviet artillery exerted great influence on the operations. Ever since the hard defensive battles of 1941, it constituted the backbone of the Russian resistance. Experience showed that every attack should be carefully prepared by artillery and mortar fire, whether executed by armor or infantry over the entire depth attainable by the artillery. In the Soviet offensives, the artillery density often exceeded 200 and, at times, 300 pieces per kilometer of front.

The duration of artillery preparation varied with the strength of the enemy defenses. Colonel General Galitzky indicated that in East Prussia it generally lasted some two hours against the first positions and twenty-five to thirty minutes against succeeding positions. But at Königsberg, it lasted three hours against the permanent works, although

the principal strongpoints had been methodically demolished beforehand.

The organization of artillery was rendered more flexible by creating large units, a great deal of which could be drawn by motor vehicles. It was therefore suited for rapid concentrations at great distances, permitting the powerful massing of fire on the most important portions of the front.

There was great variation in the employment of artillery. Highly centralized during the preparation period, during the course of which even the artillery and regimental mortars conformed to a common plan, it was divided as soon as the attack began on the orders of the "all-arms commander." The infantry regiment then had at its disposal the direct support artillery of its sector under the orders of the artillery commander of the regiment. Division and army corps commanders, in addition to their division or corps artillery, had at their disposal powerful formations operating for their benefit. The army artillery conducted counterbattery fire, shelled enemy reserves and directed its fire against highway junctions. Mortar units were either distributed as special units or placed at the disposal of armies or army corps.

The artillery operating with direct fire served afterwards as accompanying artillery and its elements were most commonly placed under the direct orders of the battalion or company commanders. This did not, however, interfere, if serious resistance were encountered in the case of some rearward position, with momentary recentralization of the artillery command for the purpose of staging a new preparation in which the air force often participated just before the attack. The artillery plan was summarized in charts distributed to all interested units.

### Role of Aviation

Aviation played a large role in the preparation and execution of attacks, not only in protection against enemy aviation and in action against enemy reserves and rear, but also in support of friendly forces just before the beginning of their attack. In order to fulfill these multiple functions, it was formed into large units. At the beginning of the war, German aviation was superior to the Soviet, although not able to dominate it completely. This situation was modified as the strategic bombardment of Germany forced the Germans to call back to their own territory a large part of their fighter aviation and slowed down their production.

In 1941, the Germans carried out a few strategic bombing attacks, especially against Moscow. Afterwards, their aviation devoted itself almost exclusively to cooperation with the German ground operations, a type of action which had always been engaged in by Soviet aviation. The military press of the USSR has often stressed the necessity of the air arm's strict conformity with the needs of the ground forces. Little use has been made of airborne troops, except in special operations.

Marshal Rotmistrov of the armored forces has declared that the principal role of armored elements—whether operating in support of infantry or carrying out an independent operation—is to destroy gun positions, particularly antitank guns which have survived artillery and air preparations.

### Protection of Armor

Armor, however, must be protected by the air forces and artillery and this requires carefully organized liaison. Self-propelled artillery avoids disclosing its positions during the period of preparation unless it is participating from the vantage point of sheltered positions. Combining mobility with power, alone, self-propelled artillery is well able to guar-

antee both tanks and infantry against enemy antitank guns and counterattacks during the period of action in the enemy rear. The armored elements must seek to reach the hostile artillery positions in order to destroy enemy batteries.

Infantry attacks were conducted as follows: Tanks assigned to the infantry battalions of the first echelon, passed through their ranks and immediately opened fire as they moved, or while briefly halted. The infantry followed, firing as they moved.

When the artillery barrage lifted, the tanks followed closely crossing the first trench and pouring their fire into the second trench. The first echelon of infantry and tanks pushed as far as possible. The task of mopping up the trenches and destroying the remaining strongpoints fell to the second echelon of the leading infantry regiments, which employed only the forces required, supported by heavy weapons, accompanying artillery, and the tanks or self-propelled artillery at their disposal. Direct support artillery supported the attacks on these points. If they offered too much resistance, the general support artillery was called on.

**Employment of Infantry**

When the most advanced infantry echelon was no longer able to advance, it was passed by the succeeding echelon. As a rule, the leading regiments were expected to take the first position to a depth of from two to three kilometers. The regimental artillery followed as soon as possible, as well as the direct support artillery. The general support artillery continued the preparation of the succeeding lines to the limit of its range. Its echeloned advance was arranged beforehand.

The succeeding echelons of the division pushed on to a depth of five to six kilometers, as far as the second position, with the assistance of their assigned tanks. They were then relieved by the second echelon of the army corps whose task it was to take the third position, a distance of twelve to fifteen kilometers to the rear. The echelons which had been passed, re-formed to constitute new reserves. The action continued in this manner for several days until the penetration was complete, reaching a depth, at times, of thirty to forty kilometers.

To protect the flank of the attack, an echelon of tanks and self-propelled artillery was maintained at the disposal of the forces, some 300 to 400 meters back of the most advanced echelon. If the infantry did not follow closely on the tanks, the latter waited for them, continuing to combat the enemy's gun positions in order not to lose possession of the terrain already won. Tanks and self-propelled artillery, accompanying the echelons and not yet engaged, protected the latter's flanks from counterattacks. Self-propelled artillery, as a rule, according to Marshal Rotmistrov of the armored forces, executed bounds of from 400 to 500 meters, halting them to deliver its fire behind favorable positions from which it could fire, at rest, with more accuracy than the tanks which were firing as they advanced.

During the advance, part of the tanks and self-propelled artillery worked together with the infantry—even down to the smallest units—in reduction of centers of resistance and in repulse of counterattacks.

In general, most of the tanks were reserved, along with attached motorized elements and cavalry, for completion of the penetration, and for exploitation or pursuit.

Deep advances which require successive attacks, also demand organization. The situation is continually modified and demands initiative, rapid decisions and constantly improvised effort. One is faced with the task of taking zones of defense

about which there is incomplete information and with being ready at any moment to ward off a counterattack. Generally the zones of defense to the rear were not so well held by the enemy. If such positions were not taken immediately, it was necessary to hold the terrain already won, execute reconnaissance, regroup the forces, and concentrate available artillery.

### Air-Armor Cooperation

Lieutenant General Stavitzky of the air force has published an article on cooperation of air forces with tanks. The latter, especially during concentrations, need air protection. They likewise need assistance during the execution of penetrations and action in the enemy's rear areas. It is incumbent on aviation to keep the high command informed about the advance of tanks and even to provide them with fuel.

Pursuit aviation ought, therefore, to maintain a constant check on the progress of tanks, keep the air staffs informed by radio about necessary intervention, and watch the flanks and rear of breakthrough units. When air intervention occurs, ground forces fire tracer ammunition at targets, and mark the front with panel strips or smoke.

### Air-Armor Rules

This general gives the four following rules for a good combination of air and armored forces: (a) a precise plan of cooperation for all the phases of the armored action; (b) radio contact between the air forces, armored forces, rapid forces following them, and succeeding infantry divisions; (c) extensive employment of radar to discover the enemy air forces and make use of fighter aviation; (d) careful preparation of the plan for airfields to guarantee uninter-

**Soviet Medium Tank, T-34.**

rupted accompaniment of the armored forces.

It is apparent from Soviet military literature that tanks, even with self-propelled artillery and aviation at their disposal, cannot themselves effect deep penetrations into the enemy's rear areas. They require the assistance of all the other arms, infantry, artillery, engineers, which cannot follow unless they are motorized.

Rapid forces separated from their own main bodies find themselves in a delicate situation. They are often obliged to engage in night marches, and to exercise great care in reconnaissance and their own protection, both by day and by night. On encountering the enemy, they are to meet him with short but violent attacks following rapid deployment, prevent him from establishing intermediate positions, or from creating new ones, cut his forces up, seize road junctions and river crossings in his rear, and disorganize his rear services. The main body, preceded by advanced detachments, seeks as quickly as possible to rejoin the armored and motorized forces.

### Use of Cavalry

In 1941, the Russians did not have sufficient motorized units. Hence they made much use of cavalry corps of several divisions strength. Colonel General Gorodovikov recalls that, in August 1941, the horse cavalry of General Dovator executed a deep raid against the communications and rear of the Sixth German army, spreading panic. He mentions many other uses for this arm.

The extensive and fruitful employment of horse cavalry, facilitated, doubtless, by circumstances in the USSR theater of operations which occurred in no other theater, assuredly deserves mention.

General Martel of the British army has called attention to the fact that one of the difficult tasks facing the high command in the execution of deep penetrations was the necessity for providing the troops participating in them with supplies for several days. They could not be burdened with cumbersome convoys nor depend entirely on aviation. In practice, the capture of enemy stores took care of a large part of their requirements.

### East Prussia

In conclusion, we shall briefly describe one of the most important encirclement operations, that of East Prussia, carried out under Marshal Jukov by the Second and Third Army Groups of White Russia. The Third Army Group attacked on 13 January from the east, north of the Lakes of Mazuri in the direction of Königsberg, while in the south, the Second Army Group started on the 14th from Narev, marching northwest in the general direction of Marienburg.

Colonel General Volsky of the armored forces stated that the armored formations intended for the breakthrough did not go into action till the fourth day when the infantry, supported by other tanks, had already penetrated a distance of thirty kilometers into the enemy's area and had passed several zones of defense. These armored formations, followed by motorized forces of all arms, progressed 200 kilometers in seven days, to the lower course of the Vistula. The shore of the Baltic was reached on 26 January. Having arrived there, these elements were able, at the same time, to face eastward to cut off the retreat of the German armies from East Prussia, and westward on the lower course of the Vistula to prevent all de-blockading efforts till the arrival of the columns of the other arms. The German forces were afterwards cut up into three main groups, at the end of January, which permitted the concentration of considerable forces against each.

The force at Heilsberg was completely liquidated by 29 March. The Germans had, by that time, already lost 50,000

prisoners, 80,000 killed, 605 tanks and 3,500 guns. The force at Königsberg was liquidated by mid-April after having been cut again into two parts, with a loss of 92,000 prisoners, 89 tanks and self-propelled guns, and 2,023 other guns. The force at Samland, with the city and port of Pillan, was overcome on 25 April. Total German losses in East Prussia reached 470,000 men.

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# Canada's National Defence College

**Digested by the MILITARY REVIEW from an article in the "Canadian Army Journal" January 1948.**

CANADA'S new National Defence College was opened at Kingston, Ontario in January 1948 by the Minister of National Defence, Brooke Claxton, who gave the opening lecture on "Defence Coordination in Canada." The first class included officers of the three armed services and seventeen senior civil servants. The College is located at Historic Fort Frontenac in Kingston.

In announcing the opening, Mr. Claxton said:

"The establishment of the College marks a new and progressive approach to the study of defense questions in Canada. It is the first effort to organize in this country an institution for the advanced study of war and security problems in relation to other aspects of national policy in times of emergency. The program will include the study of new and foreseeable developments in science, economics and international politics, and their effects upon national security.

"The United Kingdom and the United States conduct similar courses at the Imperial Defence College and the National War College, respectively. One of the primary interests of the new Canadian College will be the coordination of defense measures with external and economic policies.

## National Scope

"The National Defence College will be national in organization and scope, with representatives of the armed services and civilian departments participating on an equal basis. The College will be under the control of the Chiefs of Staffs of the Navy, Army and Air Force and the Director-General of Defence Research, as well as the Under-Secretary of State for External Affairs and the Secretary to the Cabinet.

"The National Defence College is another stage in the serious acceptance by Canada of its defense responsibilities in the post-war world. We learned by experience during the recent war, in resistance and attack, that while the modern enemy may have fierce and destructive weapons, the real power that endures and wins is a tight and undivided combination of the industrial and military, the scientific and the strategic, finance and trained manpower, the laboratory and the parade ground, the railway yards and the reinforcement camp, the sheltered man of ideas and the rugged man of arms.

"In this College for the first time in Canada we are endeavoring to give an opportunity—under the best instruction and leadership we could obtain—to civilians and men of the armed services lit-

erally to put their heads together on the problem of Canadian defense and to study it as a single operation within which the brains and industry of all of us have their legitimate place.

"There was a time when soldiers were accused of being impervious to ideas, and particularly to new ideas; when civilians looked askance at the military profession (especially in the piping times of peace); when neither realized how much in common each has as citizens of their country in the business of defense.

### Unity of Defense

"The College is an embodiment of the unity of modern self-defense; it is not military alone, not civilian; it is citizen defense.

"In this course soldiers, sailors, airmen and civilian government servants will sit down for thirty-one weeks to do two things: one is, so far as the time allows them, to survey and analyze the major problems—economic, political and military—of national defense. The other is to bring these problems into the perspective that belongs to their individual work and profession. I mean by this that the service men will emerge from the course with a firm grasp of the equilibrium that must be preserved between their strategic and tactical operations, in training as well as in war, and the economic resources and political traditions and habits of the people they serve. On the other side, the civilians, I should hope, will complete their course with a clearer understanding of the peculiar and inescapable canons of military operations, whose validity has been established by long experience and will be ignored only at great risk."

Maj. Gen. J. F. M. Whiteley of the British Army, has been named Commandant of the National Defence College.

The first course at the Defence College covers a period of seven months, January to August, and seventeen students will attend this year.

### Prominent Lecturers

The list of lecturers already scheduled to address the College includes a number of Cabinet Ministers and leaders in diplomatic, military, scientific, industrial, political, educational and other walks of life. Most of the lecturers are Canadian, but among those who have accepted invitations to take part are a number of recognized authorities in their respective fields in the United States and the United Kingdom.

Many of the problems which members of the College will be asked to tackle relate to matters on which there are as yet no generally accepted solutions. A large part of the work at the College will be tackled by students working in teams. These will seek to develop group solutions which will then be examined by the College as a whole. This method will, it is hoped, encourage the habit of thinking in terms of the national interest, rather than from a purely service or departmental point of view. An important by-product of the course will be that men who may be occupying responsible positions which relate to defense, whether military or civilian, will come to know each other well and be accustomed to working intimately together as a team.

# Hitler's Conferences

**Digested by the MILITARY REVIEW from an article in "The Fighting Forces" (Great Britain) August 1947.**

THE British Admiralty is publishing in a series of seven booklets translations of the collection of documents known as the "Fuehrer Conferences," which were captured intact at the end of the war by British and American Intelligence officers.

These documents are summaries and minutes of important conferences which Hitler held periodically with his chief commanders and staff officers. The ones being published are all concerned principally with naval matters. The first deals with the escape of the German battleships from Brest in 1942. Each conference is prefaced by an editorial giving background information relevant to the conference.

These documents give an almost unrivalled insight into the mind of the German High Command and in particular, into the part played by Hitler himself. After a general survey of the documents as a whole one cannot fail to be impressed by the amazing knowledge of at times very complicated technical detail which Hitler displays, and by his grasp of naval and military strategy as a whole. It is evident, too, that his subordinates were likewise impressed, even though they often disagreed with his views. But, in spite of this, we find Hitler guided on occasions more by intuition than by reason to make decisions that were to prove disastrous to the German cause. One of these "flairs" was his conviction throughout 1942 that we were going to invade Norway. Some of the decisions which resulted from this obsession are illustrated in the first extract.

### The Escape from Brest

By the beginning of 1942 Germany was deeply involved in the Russian campaign, towards which the major part of her war effort was directed. The West Wall was held as lightly as was deemed safe, and England appeared to the German High Command as a fortress which they had temporarily by-passed. Operation "Sealion"—the invasion of England—had been indefinitely postponed, and for the moment Hitler hoped simply to keep England on the defensive.

In spite of the U-boat campaign and the attacks of the *Luftwaffe*, however, supplies from the Empire and the Americas were pouring into the United Kingdom. British troops were fighting hard in Libya and Abyssinia, and numerous small raids were being made on the European coast. In particular, British raids on Norway greatly disturbed Hitler. Supplemented by persistent rumors and a complex political situation in Scandinavia, these raids convinced Hitler that a full-scale invasion of Norway was imminent. He believed that Sweden was on the point of joining the Allies, and he saw that a pincer movement on Norway—a British attack by sea and a combined Russian and Swedish attack by land—would enable the Allies to join forces and seriously hinder the German advance on the Eastern Front.

### Fear of Norwegian Invasion

Hitler's fear of an invasion of Norway, began towards the end of 1941 and persisted throughout the following year. It colored his entire strategy against the Western Powers, and even after the Allied landings in North Africa he still insisted that Norway was the danger area in Germany's defenses.

Germany had three zones of defense against a possible invasion of Norway. She could attack the supply routes to

the United Kingdom; she could attack the factories and towns in the United Kingdom; or she could attack the invaders in Norway itself. The supply routes to the United Kingdom and the country itself had already been under attack for two years, so that the only zone that needed strengthening was Norway.

Hitler, however, did not want to move troops from the Eastern Front. He therefore decided that the threat to Norway must be met by sea and air forces, and accordingly ordered the bulk of the German Navy to be transferred to Norwegian waters, and the *Luftwaffe* squadrons in Norway to be considerably increased.

The transfer of the German High Seas Fleet presented an extremely difficult problem. Part of the fleet was at Brest and part was training in the Baltic, so that it was impossible to assemble a sufficiently strong force to meet the British Fleet, which was know to consist of at least three battleships and two carriers stationed at Scapa Flow. The ships in the Baltic could be transferred comparatively simply, but those at Brest had either a long voyage around the British Isles in the Atlantic, where they would almost certainly be attacked by the Home Fleet, or a shorter but equally hazardous voyage through the English Channel.

### Units at Brest

The three major units of the German Fleet at Brest *(Scharnhorst, Gneisenau* and *Prinz Eugen)* had served the useful purpose of containing the British Fleet in home waters and of distracting British air attacks from German cities, and Raeder, Commander in Chief of the German Navy, was loath to run the risk of moving them. He disagreed with Hitler that the threat to Norway was serious and strongly opposed the movement of the Brest Group. The crews were untrained and the ships had had no opportunity of attaining anything like full fighting efficiency, so that a long sea voyage round the British Isles and opposed by the British Fleet was out of the question.

If the ships were to be moved at all they would have to go through the Straits of Dover.

Hitler, however, insisted that the threat to Norway was extremely serious and that the ships at Brest should be moved.

This decision was made at the end of December 1941, and on 12 January 1942, Raeder submitted his plans for the movement of the Brest Group through the Channel.

HIGH COMMAND, NAVY.
NAVAL STAFF.

*Memorandum concerning the Report the Commander in Chief, Navy, made to the* Fuehrer, *12 January 1942, on the Planned Passage of the Brest Group Through the Channel*

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II. *Minutes of the Conference:*

1. THE COMMANDER IN CHIEF, NAVY, opened the session with the following remarks:

"The question of the passage of the Brest Group through the Channel has been examined by all agencies concerned. In the light of the *Fuehrer's* opinion, the German Fleet's primary task is to defend the Norwegian coast and ports and, in so doing, it should use its might unsparingly.

"All parties concerned therefore have approached this study with an *open mind.* Even though, on the basis of this study, I do not believe that I should take the initiative in advocating such a breakthrough operation, plans have been worked out that ought to be followed should the break through the Channel be decided upon.

"Since you, my *Fuehrer,* informed me that you insist upon the return of the heavy units to their home bases, I suggest that Vice-Admiral Ciliax report on

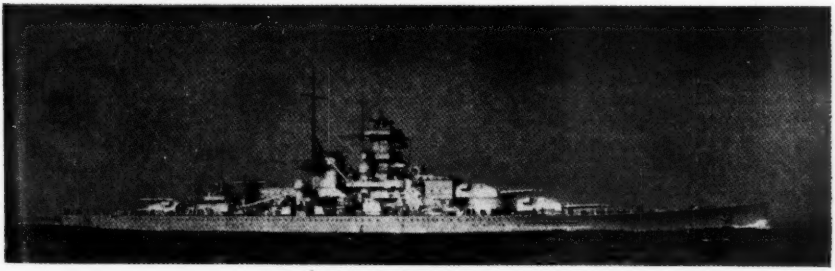
the details of *how this operation is to be prepared and carried out*, and that Commodore Ruge subsequently report on the necessary security measures, mine-sweeping measures, etc., to enable you, my *Fuehrer*, to make the final decision afterwards."

### Hitler's Estimate

2. Following these introductory remarks, the *Fuehrer* expressed himself as follows:

The Naval Force *(Geschwader)* at Brest has, above all, the welcome effect of tying up enemy air forces and diverting them from making attacks upon the German Homeland. This advantage will last exactly as long as the enemy considers himself compelled to attack because the ships are undamaged. With our ships at Brest, enemy sea forces are tied up to no greater extent than would be the case if the ships were stationed in Norway. If he—the *Fuehrer*—could see any chance that the ships might remain undamaged for four or five months and, thereafter, be employed in operations on the Atlantic, in consequence of a changed over-all situation, he might be more inclined to consider leaving them at Brest. Since in the opinion of the *Fuehrer* such a development is not to be expected, however, he is determined to withdraw the ships from Brest, to avoid exposing them to chance hits day after day.

On the basis of incoming reports and in view of the increasingly unfriendly attitude of Sweden, the *Fuehrer*, furthermore, fears that there will be a large-scale Norwegian-Russian offensive in Norway. He thinks that if a strong task force of battleships and cruisers, practically the entire German Fleet, were stationed along the Norwegian coast, it could, in conjunction with the German Air Force, make a decisive contribution toward the defense of Norway. He therefore is determined to have the main strength of the German naval forces shifted to that area.



**The German battleship *Scharnhorst* was successfully evacuated from Brest.**

3. Subsequent to these fundamental observations of the *Fuehrer*, the Commanding Admiral of Battleships reports on necessary preparations and planning. The following points are given special emphasis in this report:

(a) The demand for a minimum of ship movements prior to the operation. The Fuehrer expresses agreement with the opinions presented by the Commanding Admiral of Battleships.

(b) The necessity of leaving Brest under cover of darkness, taking maximum advantage of the element of surprise, and of passing through the Straits of Dover in the daytime, thus making the most effective use of the means of defense at our disposal. The *Fuehrer* likewise expresses approval, emphasizing particularly the surprise to be achieved

by having the ships leave after dark.

(c) It is stressed very emphatically that a very strong pursuit and fighter cover should be provided on the day of the breakthrough itself from the beginning of dawn to the end of dusk.

**Importance of Air Force**

The *Fuehrer* is aware of the decisive role to be played by the Air Force in this enterprise. Lieutenant General Jeschonnek does *not* believe that he will be able to provide constant unfailing protection for the ships with the available two hundred and fifty fighters, which cannot possibly be reinforced. He then promises to draw on the existing night fighter formations to provide dawn fighter protection.

4. Subsequent to this report of the Commanding Admiral of Battleships, the *Fuehrer* asks for opinions as to the feasibility of using the northern route. He makes it clear that he does not care which route is selected by the Navy, if only it is successful in getting those ships transferred to Norwegian waters.

The Commander in Chief, Navy, the Chief of Staff, Naval Staff, and the Commanding Admiral of Battleships explain that the northern route is *not* suitable, for several reasons. First of all, due to the training situation at Brest, it has been impossible to train crews for full-scale battle maneuvers. The present disposition of enemy forces also is against such a move; there are two or three battleships and two aircraft carriers in the Home Fleet. And, lastly, the German air forces would not be able to provide the necessary air cover.

5. Commodore Ruge then reports on defense problems and the mine situation, coming to the conclusion that, while the deep-water channel cannot be called absolutely safe from mines, a relative measure of safety none the less does exist.

6. The *Fuehrer* subsequently points out once more that the success or failure of this undertaking will depend on how well the secret of it is kept.

7. The Commander in Chief, Navy, again emphasizes the demands to be made on the Air Force for:

(a) A very strong fighter cover.

(b) Attacks on airfields serving enemy torpedo planes in the early morning of the day of the breakthrough, and possibly a few days earlier.

**Lack of Air Reinforcement**

Lieutenant General Jeschonnek replies to this as follows:

In view of the over-all situation, reinforcement of our air forces in the West is impossible; however, in compliance with the *Fuehrer's* orders, the question will be examined *once again.*

The constant air cover, as demanded by the Commanding Admiral of Battleships, will leave insufficient aircraft for the heavy air battles that are sure to develop on the day of the breakthrough. We may expect our fighter force to become very inferior in strength, at least during the afternoon.

Lieutenant General Jeschonnek also calls attention to the fact that, in the afternoon, our own antiaircraft personnel is susceptible to fatigue, as experience has shown.

8. The *Fuehrer* sums up once more:

(a) The ships must not leave port in the daytime because we are dependent on the element of surprise.

(b) This necessarily means that they will have to pass through the Dover Straits in the daytime.

(c) In view of past experience, the *Fuehrer* does not believe the British capable of making and carrying out lightning decisions. This is why he does not believe that they will be as swift as was assumed by the Naval Staff and the Commanding Admiral of Battleships in shifting their bomber and pursuit forces to the south-eastern part of England for an attack on our ships in the Dover

Straits. The *Fuehrer* illustrates his argument by picturing what would happen if the situation were reversed, i.e., if a surprise report came in that British battleships have appeared in the Thames Estuary and are heading for the Straits of Dover. In his opinion, even we would hardly be able to bring up air pursuit forces and bomber forces swiftly and methodically.

He compares the situation of the Brest Group with that of a patient having cancer who is doomed unless he submits to an operation. An operation, on the other hand, even though it may have to be a drastic one, will offer at least some hope that the patient's life may yet be saved. Passage of our ships through the Channel would be such an operation. *It must therefore be attempted.*

9. Colonel Galland is of the opinion that the strong Spitfire forces at the disposal of the British will render things difficult for the long-range fighters which we are going to employ.

10. In closing, the Commander in Chief, Navy, again points out emphatically that success or failure of the enterprise will hinge upon the way in which our air forces are used. He once more asks the *Fuehrer* for a directive to the Air Force *to do everything in its power that might further the security of the ships.*

The *Fuehrer* directs Lieutenant General Jeschonnek to do so. The latter, however, emphasizes again that unfailing protection cannot be guaranteed because of the lack of needed reinforcements.

11. Tide and daylight will determine the timing of the operation. That is the reason why the date of the operation cannot be changed. The Commander in Chief, Navy, then asks what should be done in case one or several ships are unable to move on the date set.

It is decided that, if two battleships are in a position to move, they are to undertake the operation, if necessary without the cruiser. If only one battleship and the cruiser can move, they are to do likewise. But in no case should the *Prinz Eugen* do so alone.

**The German battleship *Gneisenau* figured prominently in the *Fuehrer's* conferences.**

12. Finally the question of transferring the *Tripitz* is raised by the Chief of Staff, Naval Staff, and the *Fuehrer* decides that the *Tripitz* is to be transferred at once.

13. Finally, the *Fuehrer* emphasizes once more that nothing can be gained by leaving the ships at Brest. Should the Brest Group manage to escape through the Channel, however, there is a chance that it might be employed to good advantage at a later date.

If, on the other hand, the ships remain at Brest, their "flypaper effect," i.e., their ability to tie up enemy air forces, may not continue for long. As long as the ships remain in battleworthy condition they will constitute worth-while targets, which the enemy will feel obliged

to attack. But the moment they are seriously damaged—and this may happen any day—the enemy will discontinue his attacks. Such a development will nullify the one and only advantage derived from leaving the ships at Brest.

In view of all this, the *Fuehrer*, in accordance with the suggestions of the Commander in Chief, Navy, finally decides that the operation is to be prepared for as proposed.

(Signed) RAEDER.

(Countersigned) LIEUT. COMMANDER ASSMANN.

Rumors and reports of Allied preparations for an attack on Norway persisted. Hitler became even more convinced that an invasion was imminent and hastened both military and political measures to meet the threat. Troops were to be moved now as well as ships and aircraft, and, at a conference ten days later, outlined his schemes for the defense of Norway.

*Report by the Chief of Staff, Naval Staff (Vice-Admiral Fricke), on the Conference with the* Fuehrer *on 22 January 1942.*

I Norway:

1. Latest reports have thoroughly convinced the *Fuehrer* that Britain and the United States intend to make every effort to influence the course of the war by an attack on Northern Norway. Several places along the coast from Trondheim to Kirkenes will probably be occupied shortly. Sweden's support in a spring offensive is expected, for which she would receive Narvik and ore deposits near Petsamo. Finland would be guaranteed her independence within the old borders.

The *Fuehrer* has proof of Sweden's willingness to participate and therefore plans the following:

(a) To expose the intentions of Britain and the United States as well as Sweden's attitude in the world Press.

(b) To appoint Field Marshal Von Keselring as Commander of the Armed Forces in Norway.

Anglo-Saxon domination of the Swedish area will gradually eliminate all freedom of action in the Baltic Sea. Should German naval units still be in the Baltic under such circumstances, we should immediately disarm them completely. The only ships from which we could salvage any appreciable amount of nickel would be the battleships.

The *Fuehrer* is convinced that Norway is the "zone of destiny" in this war. Therefore he demands unconditional obedience to all his commands and wishes concerning the defense of this area.

2. The *Fuehrer* ordered a considerable reinforcement of Army personnel and matériel in Norway. The Commander in Chief, Air, was instructed to strengthen his forces. The latter anticipates certain difficulties; he is short of aircraft; reconnaissance and fighting are limited in bad weather; besides, the Norwegian airfields are inconveniently located and are all too few.

The *Fuehrer* desires that the Navy must also do *everything in its power* to head off the British offensive at the very start. The Navy must take over adequate reconnaissance in weather not fit for flying. It must defend the sea lanes to Norway, and must dislodge with all available forces any enemy troops which have landed, entirely foregoing all other warfare "except for the Mediterranean operations."

3. The *Fuehrer* agrees to let the Brest Group complete its mission, using all light defense forces. E-boats are to remain in the Channel.

The *Fuehrer* demands that *every available vessel* be employed in Norway. He endorses our plans to use battleships, pocket battleships, heavy cruisers, light naval forces and E-boats; increases his demand for submarines; is of the same opinion as the Naval Staff concerning

the improbability of a landing in Western France.

4. The *Fuehrer* orders even more of the heaviest artillery pieces to be mounted in Norway. He demands that all heavy-caliber guns available be tested and made ready.

5. It will be necessary to investigate further the possibility of bringing in supplies by submarine.

6. The *Fuehrer* emphasized several times that the greatest speed and efficiency are vitally important. He is deeply concerned about the grave consequences which unfavorable developments in the North Norwegian area could have on the entire course of the war.

II. The *Fuehrer* had no comments to make on the oil problem which I presented as being very serious, especially in view of the planned operations.

(Signed) FRICKE.

By the beginning of February plans for the movement of the Brest Group were completed. The naval force was under the command of the Vice-Admiral, Battleships, Vice-Admiral Ciliax, and the *Luftwaffe* squadrons under the command of Colonel Galland. For once the *Luftwaffe* had cooperated fully with the Navy, and, in spite of the objections raised at the earlier conference, Colonel Galland had secured an adequate number of both short-range and long-range fighters to cover the operation. More than 250 aircraft were made available to protect the naval force.

On the evening of 11 February the *Scharnhorst, Gneisenau* and *Prinz Eugen,* accompanied by destroyer and E-boat escort, slipped out of Brest and began their dash up the English Channel. They were not sighted until shortly before eleven o'clock on the following morning.

The escape had been anticipated in England, but owing to the delay in receiving the sighting report it was not until 1230 that the first attack by motor torpedo boats was delivered. Naval aircraft attacked a quarter of an hour later under extremely hazardous conditions, but all six aircraft were shot down by the German fighter cover. At 1545 six destroyers of the Royal Navy also went into action, while during the afternoon RAF bombers attacked repeatedly for two and a half hours, but with no effect. The German operation had succeeded far beyond their hopes.

"Vice-Admiral Ciliax," wrote *The Times,* "has succeeded where the Duke of Medina Sidonia failed. . . . Nothing more mortifying to the pride of sea power has happened in home waters since the seventeenth century."

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**Sea power means no more and no less than a nation's ability to control the ocean routes over which its commerce must move to carry vital imports and exports in peace and war, and over which its fleets must operate in that nation's defense.**

*Fleet Admiral Chester W. Nimitz*

# Rapid Troops

**Translated and Digested by the MILITARY REVIEW from an article by Major General Henry Peyron in "Ny Militar Tidskrift" (Sweden) No. 8, 1947.**

THE idea, which was very prevalent after 1918, that future warfare would be positional and with little movement, manifested itself in great reductions in Swedish cavalry, the only highly mobile type of arm at that time. However, foreign military writers, as well as those in Sweden, urged that armies should break away from the fixed system of positional warfare and turn to mobile methods.

By that time, we possessed nothing in the way of rapid troops but our greatly reduced cavalry, which consisted exclusively of mounted forces. In the interests of mobility, it was necessary to develop this branch of the service and complement the existing mounted cavalry with other types of rapid forces, motorcycle and bicycle. In the field, these forces would be able to measure up to the new concept of mobility, "wheeled forces" for speed on the road and "mounted forces" for use across country. This thought was fundamental in the development of the cavalry in the late 1920's and thereafter.

### Changes Resisted

But ideas and efforts met with resistance. The cavalry maintained that, with mounted forces weakened as they had been since 1925, it made little difference if their place were taken by motorcycle and bicycle troops. This narrow attitude showed lack of understanding of tactical requirements, and a certain amount of bias for the mounted forces.

Resistance was also encountered elsewhere. Many persons opposed the employment of cavalry organized in the form of an all-round, light, rapid type of force.

Efforts to restore the cavalry aimed not only at creation of motorcycle and bicycle formations, but included mounted forces with certain organizational changes whose purpose was to increase the efficiency of the field formations.

Little by little, appreciation of the efforts being made in behalf of the cavalry became noticeable. This awakening was manifested, among other ways, by the fact that the first large motorized formation created in Sweden, the so-called Motorized Corps in 1929, was provided with a thoroughly cavalry-minded command.

Development continued along these lines. Tests of various kinds, together with exercises to perfect the organization and equipment of ten new armored car squadrons and other motorized units, were held. Tactical employment of the all-round, rapid formation, became an object of thorough study.

The peacetime organization under the defense law of 1936 was, to a large extent, a good basis for the all-round, light, and rapid troop formation.

### Field Experiments

Larger, independent cavalry units were tried out in field exercises. Gradually, the idea gained headway that such cavalry organized for strategic employment should be completely motorized. The cavalry brigade which went into the field in 1940 was completely motorized. But cavalry formations originally designed for local, tactical activity, were mixed for better results.

In the autumn of 1940, the commander in chief informed the inspector of cavalry that a transfer of one of the four regiments to the new armored formations was contemplated. As a result of this, the inspector made the following declarations:

"In the reorganization of a cavalry regiment, one gains an extremely rich fund of knowledge, much skill, and famil-

iarity of routine relative to light and rapid formations. The total scope of rapid forces would be extended if, in the creation of new armored formations, infantry instead of cavalry regiments were used. By so doing, speed and mobility would be accorded a broader basis in the peacetime organization, in the interest of creating the greatest possible number of high quality combat formations."

Meanwhile, development continued in the cavalry. Various new experiments and tests took place, mainly with motorcycle and bicycle troops, which ended with "rapid troop maneuvers" in August 1941. There were signs that the defense command was thinking of combining all rapid forces, including armored forces, into one type of force, possibly on the pattern of German organization.

This was the proposal made in the defense report of 1941. In October 1941, the word quietly went about that all the cavalry's armored car squadrons were to be transferred over to the new armored arm.

With the transfer of the armored car squadrons out of the cavalry, the latter lost its character of an all-round rapid force. Thenceforth, it would have only mounted forces and cycle troops at its disposal.

### Eclipse of Cavalry

About the same time came the announcement that the defense report had proposed the discontinuation of the cavalry inspector's office. The report asserted that infantry and cavalry training and employment were so similar that both forces could be joined under the same inspector. But no account was taken of the cavalry's special characteristics, its speed. Strong arguments against the proposal were advanced by many responsible military authorities.

In spite of dissatisfaction, the proposal was approved by the cabinet, then by the defense committee and, finally, in 1942, it became a parliamentary law. Also in the 1943 session of parliament, the question of the cavalry inspector was again taken up. Motions signed by conservatives, liberals, farmers' union members and social democrats, were presented, proposing the retention of the office, but to no avail.

Combined with the infantry, the cavalry service no longer possesses a sponsor especially suited for conducting and inspecting its special tactical training.

The cavalry is now, in its peacetime organization, practically composed of mounted forces only. It has travelled around in a circle from the pure type of mounted forces it was before 1926 to the pure type of mounted forces it is today. But the tactical, organizational and technical knowledge gained by the cavalry, in the meantime, in the various fields of the rapid force service, has been of profit to the army.

The pure cavalry organization has, without doubt, advantages. Its interests and training can be concentrated on horsemanship. On the other hand, the organization possesses the disadvantage that the necessary tactical collaboration between the various types of rapid forces in the field can no longer be prepared in time of peace in the same way as when cavalry regiments possessed a more diverse composition.

### Organization for Speed

Even though almost every formaton is able to develop a certain degree of rapidity and mobility by employment of transportation, it is likely in the future that certain forces will possess characteristics of speed, namely, those permanently organized with transportation, such as armored forces and cycle or mounted forces.

As to a permanent organization of rapid forces, the following general ideas, including those based on experience, may

be offered. An operation often requires the collaboration of various kinds of rapid forces, certain formations making use of their speed along roads, and others across country. It is hoped that formations will be trained for this collaboration so that the necessary leaders and command groups will be familiar both with the activities of their own and those of other rapid formations when engaged in common tactical operations. Without this training, there is the danger of improvisation.

Collaboration should be practiced as often as possible between the rapid formations which may appear simultaneously in the field. Peacetime organization should, therefore, render conditions favorable for such training.

However dissimilar the forces under discussion may be as regards transportation or methods of combat, they will possess similar tactical thought. Their tactical activity will be marked by rapid movement and surprise action. On the whole, the command of rapid forces presents problems which require varied degrees of speed in decision and action, with ability to collaborate with other rapid forces. It seems, therefore, particularly desirable that tactical training in these formations should follow the same principles. It is important that the organization of the various types of rapid formations should conform to the requirements of similar tactical training.

Technical developments have not yet reached the point where the Swedish army is able to dispense with mounted troops. Science has not succeeded in producing motor-driven transportation capable of satisfactory movement through forest, marsh or snow, and ability to climb, and do it rapidly and silently. Within our possible areas of operation, mounted forces can be very important.

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# The Iraqi Army

**Digested by the MILITARY REVIEW from an article by Major W. N. Seymour in the "Journal of the Royal United Service Institution" (Great Britain) November 1947.**

THE strategic position of Iraq in the Arab world gives her an importance to the Arab League of which she is fully aware. She is astride the line of communication to the Far East, with her eastern flank resting on the non-Arab States of Iran and Turkey; with an excellent port in Basra and two partially navigable rivers, it is obvious that modern development can make of her a nation whose importance, not only to the Arab States but internationally as well, cannot be underestimated.

Enormous progress has been made since the country first came under British influence at the end of World War I, and improvements since then in the armed forces, health, finance, commerce, communications and town planning are very real and noticeable. That is not to say, however, that there is no more to be done; the country ended that war in a state of confusion and destitution; the Ottoman Empire was never renowned for constructive development and Mesopotamia was no exception to Imperial Turkish misgovernment with all its attendant horrors.

## British Influence

Iraq has been very closely associated with Great Britain since 1918, particularly during the time of our mandate, which ended in 1932, and again during World War II, when, in 1942, the urgency of the Russian situation turned Iraq into

a strategically important base for Allied troops. During these two periods much has been done for Iraq by the British, and it was due to the military situation in 1942 that roads were built in the North, thus opening up the most beautiful part of the country.

### Modernization

At the time of writing, there is an agitation on the part of the army for modernization. At present, of course, it cannot be compared with that of a modern power but, broadly speaking, it consists of a mountain division; a plains division; a third division—until recently in charge of training, but now chiefly responsible for administering a fairly up-to-date mechanized force; a river gunboat force; and various ancillary arms. The mountain division has pack transport and the plains division is in a state of semi-mechanization. There is an overall shortage of much modern equipment and weapons: Light machine guns are on an inadequate scale, 3-in. mortars are just arriving in the country, and the infantry still has the Boys antitank rifle. There is, in fact, a good case for bringing the army more up-to-date with heavier armor and armament, but on the other hand it is open to argument whether a modern army, such as we know it, can be formed on an efficient basis before the more important needs of the community have been attended to.

The low standard of education pertaining throughout the country is even now having its effect upon the army. It is not possible to train every man to be an efficient Bren gunner, and the high proportion of illiteracy results in many of the best men being seized by the technical arms to the detriment of the infantry, whose importance has not yet been fully recognized in Iraq.

### Communications

Similarly, a modern army needs good communications; in Iraq, these are still poor; the roads are not adequately maintained and it appears that foreign technicians, as opposed to advisers, could do a useful job in this direction. The railways, although efficient, are badly in need of more rolling stock and at present are not capable of handling a large supply of military traffic and equipment without serious dislocation. Rivers are not satisfactory lines of communication by themselves, so if the Iraqi army is going to acquire modern equipment, vehicles and tanks, it will be necessary to pay attention and money to improving the

roads and railways. Air strips and airdromes too need to be improved before the air arm can be supplied with heavier bombers and faster fighters.

Social services are at present little understood, or if understood, are certainly not fully practiced. The health of the people, while showing an improvement over past years, is still in an unhappy state; national insurance and a comprehensive pensioning system is still in its infancy.

A modern army needs good recruits; these would be more easily obtained if adequate protection was assured by the

state for the soldier's family, for he would be more inclined to join up and serve his country if he knew that in his absence their welfare would be taken care of.

### Recent Improvements

A great deal of money is now being spent on the army. New and expensive types of airplanes have recently been purchased. A large number of military exercises are taking place, officers are sent on courses to England when opportunity occurs, and much new equipment and guns are on order. All this, however, is a drop in the ocean compared with what will have to be spent if the army is to be completely modernized, even though the fighting strength is little above two divisions. Is this great expense justified? The question is not easy to answer without some knowledge of the Iraqi budget and the country's fiscal system.

Iraq is certainly not a rich country, and it is questionable whether it is wise to spend so much money on the army until the social services and the over-all economy of the country have been built up on a strong and prosperous footing. This is purely a question of policy for Iraq, and nobody else, to decide.

The military factor, however, can be viewed from a separate angle. To begin with, there is an ever-present threat in the north that the Kurds led by Mulla Mustapha, or any other fanatic, might come down from their mountain strongholds and invade Northern Iraq as they did in 1945: a possibility that cannot be discounted even though recent fighting with the Persians resulted in a surrender to the Iraqis of a substantial number of the recalcitrant tribesmen.

### Mountainous Terrain

The part of the country where trouble is most likely is very mountainous and only accessible by steep and narrow trails; for the most part it is not passable to any form of motor transport, and the only troops that can be used are those trained and toughened by mountain exercises. It is therefore necessary to maintain a mountain division, and this at present is kept, quite rightly, as the strongest of the two fighting divisions. This means that complete modernization can only reach one division, the mechanized force, some gunners, engineers and signallers.

The natural desire of the Iraqi government is to be able to defend the country against all comers; but modernizing two divisions will not do this; help will still be needed, and obviously forthcoming, from outside. On the other hand, there is a very real danger of tribal warfare which, with a little encouragement from trouble makers, can assume formidable proportions, and against this no outside help can be expected.

It would seem, therefore, that the mountain division must remain as such with modern equipment and armament consonant with its role. The plains division, the mechanized force, artillery, engineers and signallers could be brought up to date gradually as money became available. The need for modern equipment is obvious, but this must not be allowed to outpace the state of readiness within the division itself. Gradually modern weapons must replace the older types and, as the standard of education of the recruit improves, the speed of this rearmament can be increased until a modern division is arrived at with up-to-date armored units and aircraft to support it. In the years to come health and prosperity will increase and the army can be expanded on a modern basis until eventually Iraq achieves her ambition of a fighting force capable of operating against an aggressor with modern armament. But this will need time, money and careful planning by all branches of the executive—it is not wise for a country to try and keep more armed forces than its economy will support.